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CITY OF MANCHESTER.

REPORT

ON THE

Health of the City of Manchester,

1900.

BY

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PUBLIC HEALTH OFFICE,

TOWN HALL, MANCHESTER.

SEPTEMBER 10th, 1901.

MY LORD MAYOR, ALDERMEN, AND MEMBERS
OF THE CITY COUNCIL.

I have the honour to place before you my Annual Report on the Health of the City for the year 1900.

A considerable section of the Report deals with the subject of Tuberculosis. The deliberations of the recent Congress on Tuberculosis, and the resolutions arrived at as the result of the discussions and papers read, endorse and emphasise the action taken by the City Council. The work done during the year 1900 furnishes material for careful reflection, and, it may be, for fresh action.

The work done by Dr. Coates, under the direction of Professor Delépine, in connection with the infectivity of houses inhabited by consumptives is of much importance. It completely confirms Cornet's work, and is of wide application.

The small outbreaks of Plague in Glasgow in 1900, and of Typhus in Manchester, taken along with the facts relating to Tuberculosis and Summer Diarrhoea, direct attention to the profound importance of ensuring cleanliness in inhabited houses. Ample powers exist under a Local Act for this purpose.

The question of providing suitable dwellings for the poorer classes of the community is at present engaging the attention of the Sanitary Committee. The acquisition of the Blackley Estate for the erection of Workmen's Dwellings is an important step, which will go far to enable the Sanitary Committee to fulfil the requirements of the City Council in dealing with insanitary houses.

It remains necessary to make more ample provision for the isolation of cases of Smallpox. The Monsall Hospital has been much improved during the past two years, and the Sanitary Committee continue to give to it much care and thought.

The facts relating to the recent outbreak of Arsenical Poisoning have already been submitted to you. They appear to point particularly towards the necessity of a careful investigation of injurious influences exerted, from one cause or another, by different food stuffs.

I have the honour to be,

My Lord Mayor, Aldermen, and Councillors,

Your obedient Servant,

JAMES NIVEN,

Medical Officer of Health.

TABLE OF CONTENTS.

	PAGE
VITAL STATISTICS	1-16
NOTIFIED INFECTIOUS DISEASES	17-18
Smallpox	18-20
Scarlet Fever	21-46
Tables regarding	21-24
Bacteria in the soil	26
Return cases of	26-32
School infection	26, 37-46
Home infections	32-33
Connection with defective privies	34-36
Milk supply	46
Diphtheria and Membranous Croup	47-68
Tables regarding	47-49
Incidence on City	50
Distribution	50
Bacteriological examination of membrane from cases of ...	50-58
Direct infection	58
Return cases.....	59
Influence of schools.....	59
Overlooked cases.....	59
Paralytic complications in	62-66
Fouling of the ground and closets	66
Insanitary conditions associated with	67
Enteric or Typhoid Fever	68-85
Tables regarding	68-71
Seasonal wave	72
Water pollution and.....	73
Ice cream and	73
Overlooked cases.....	73
Bacteriological examinations	73
Direct infection	74-78
Milk infection and	79-82
Shell-fish and	83-84
And closets	84-85
Typhus Fever	86-87
Plague	87-94

MEASLES	95-101
Tables regarding	95-96
And schools	98-101
WHOOPING COUGH	96-101
Tables regarding	96-97
SUMMER DIARRHŒA	102-107
Tables regarding	102-104
Effect of season	104
Breast-fed children and	105
Chart	107
VOLUNTARY NOTIFICATION OF PHTHISIS.....	107-134
Administration.....	107-108
Bacteriological examinations	109
Cleansing and disinfection	109
Home isolation	110
Ætiology of	111-127
Infective power of dust	128-134
MILK AND TUBERCULOSIS.....	135-155
Manchester cowsheds	136
Manchester cows.....	136
Housing and grazing of cows in Manchester.....	137
Milk clauses.....	139
Tuberculous milks	139-141
Disposal of cows having tuberculous udders.....	141-155
ICE CREAM POISONING	155-156
ARSENICAL POISONING	156-158
BAKEHOUSES	158-159
HOUSING OF THE WORKING CLASSES	159-162
EFFLUVIUM NUISANCES	162-165
WORK OF THE LADIES' HEALTH SOCIETY	165-168
WORK OF THE LADIES' SOCIETY FOR VISITING THE JEWISH POOR ...	165-168
WORK OF SPECIAL JEWISH HEALTH VISITOR	168
MEDICAL SUPERINTENDENT'S REPORT ON MONSALL HOSPITAL	169-182
WORK OF SANITARY DEPARTMENT.....	182-197
WORK OF CLEANSING DEPARTMENT	198-199
WORK OF MARKETS DEPARTMENT <i>re</i> UNWHOLESOME FOOD	200-202

LIST OF TABLES.

TABLE	PAGE
1. 1900—Recorded and Corrected Death-rates in the 33 Towns	2
2. Do. Marriage, Birth, and Death-rates in England and Wales, with the total value of Exports of British and Irish Products, 1865-99	4
3. Do. Prices of Flour, Butchers' Meat, and Coal	6
4. Do. Deaths in Public Institutions	7
5. Do. Death-rates in Manchester at various age-groups in 1900 compared with Manchester, 1891-1899, and England and Wales, 1881-90	10
6. Do. Recorded and Corrected Death-rates of Manchester in Civil Parishes	12
7. Do. Death-rates in the Homes of the People, in Workhouses, and in Hospitals, calculated on Censuses 1881 and 1891..	13
8. Do. Do. do. do. 1891 and 1901..	14
<hr/>	
A. 1900—Causes of Mortality at certain age-groups	204-207
B. Do. —Summary of preceding Table	208
C. Do. —Causes of Mortality of Males, at age-groups	209
D. Do. do. Females, do.	210
E. Do. —Causes of Mortality in Infancy and Childhood	211
F. 1871-1900—Population ; Marriage, Birth, and Death Rates ...	212-213
G. 1881-1900—Rates of Mortality from certain causes	214
H. 1900—Population Area, Density, Births, and Deaths, with Rates...	215
J. Do. —Illegitimacy and Infantile Mortality	216
K. Do. —Infantile Mortality in Divisions.....	217
L. Do. —Mortality from all causes, in Divisions	218
M. Do. —Mortality at age-groups (City)	219
N. Do. —Certification of Cause of Death	220
O. Do. —Patients admitted to Isolation Hospitals	221
P. Do. —Work of Sanitary Department	222



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ANNUAL REPORT.

STATISTICAL.

The more outstanding figures relating to the year 1900 are as follows:—

Estimated population by the Registrar-General	<table><tr><td>Males.....</td><td>264,797</td></tr><tr><td>Females...</td><td>286,067</td></tr></table>	Males.....	264,797	Females...	286,067	550,864
Males.....	264,797						
Females...	286,067						

Population estimated from the Census figures for 1891 and 1901, on the supposition of a uniform rate of increase 542,566

Persons married in Manchester, Prestwich, and Chorlton	
Unions	12,008

Annual rate of persons married per 1,000 of population	
on an estimated population of 668,202	18'0

Births ...	{	Males.....	8,847	}	.....	17,564
	{	Females.....	8,717	}		

Annual rate of births per 1,000, estimated on the old population.....	31'9
---	------

Annual rate of births per 1,000, estimated on the new population.....	32'4
---	------

Deaths ...	{	Males.....	6,642	}	.....	12,903
		Females.....	6,261	}		

Annual rate of mortality per 1,000, estimated on the old population	23.4
---	------

Annual rate of mortality per 1,000, estimated on the new population.....	23·8
--	------

Excess of registered births over deaths	4,661
---	-------

Estimated increase of population during the year.....	3,897
---	-------

The death-rates of the 33 large towns, in their crude form, and as corrected for sex and age distribution, are shown in the following table, extracted from the Registrar-General's Annual Summary :—

TABLE 1.—RECORDED AND CORRECTED DEATH-RATES PER 1000 PERSONS LIVING IN 33 GREAT TOWNS DURING THE YEAR 1900.

TOWNS in the order of their Corrected Average Death-rates	Standard Death-rate	Factor for correction for Sex and Age distribution	Recorded Death-rate, 1900	Corrected Death-rate, 1900	Compara- tive Mortality Figure, 1900
	Col. 1	Col. 2	Col. 3	Col. 4	Col. 5
England and Wales	19·15	1·0000	18·31	18·31	1,000
England and Wales less the 33 Towns	} 19·46	0·9840	17·61	17·33	946
33 Towns	17·72	1·0806	19·54	21·11	1,153
Croydon	18·37	1·0424	14·60	15·22	831
Cardiff	17·16	1·1159	13·77	15·37	839
Norwich	19·99	0·9579	17·57	16·83	919
West Ham	17·75	1·0788	15·93	17·19	939
Bristol	18·45	1·0379	16·66	17·29	944
Portsmouth	18·73	1·0224	17·28	17·67	965
Brighton	18·94	1·0110	17·84	18·04	985
Birkenhead	17·42	1·0993	16·82	18·49	1,010
Swansea	17·53	1·0924	17·07	18·65	1,019
Bradford	16·81	1·1391	16·41	18·69	1,021
Burnley	16·67	1·1487	16·30	18·72	1,022
Leicester	17·64	1·0855	17·43	18·92	1,033
Derby	17·36	1·1031	17·46	19·26	1,052
Huddersfield	16·47	1·1627	16·78	19·51	1,066
London	17·97	1·0656	18·79	20·02	1,093
Halifax	17·20	1·1133	18·12	20·17	1,102
Plymouth	19·70	0·9720	20·80	20·22	1,104
Gateshead	17·83	1·0740	19·02	20·43	1,116
Nottingham	17·81	1·0752	19·10	20·54	1,122
Hull	18·23	1·0504	19·75	20·75	1,133
Newcastle	17·58	1·0892	19·51	21·25	1,161
Bolton	16·90	1·1331	19·45	22·04	1,204
Leeds	17·28	1·1082	20·00	22·16	1,210
Oldham	16·72	1·1453	19·55	22·39	1,223
Sunderland	18·25	1·0493	21·41	22·47	1,227
Blackburn	17·05	1·1231	20·48	23·00	1,256
Wolverhampton	18·30	1·0464	22·51	23·55	1,286
Birmingham	17·33	1·1050	21·53	23·79	1,299
Sheffield	17·22	1·1120	22·59	25·12	1,372
Preston	17·42	1·0993	24·03	26·42	1,443
Manchester	16·90	1·1331	24·13	27·34	1,493
Liverpool	17·44	1·0980	25·66	28·17	1,539
Salford	17·03	1·1244	25·10	28·22	1,541

The principal causes of death during the year were :—

Tubercular Disease	1,557	Cancer	412
Pneumonia	1,624	Premature Birth	342
Bronchitis	1,355	Apoplexy	306
Diarrhœa and Simple		Whooping Cough.....	371
Cholera	822	Old Age	225
Diseases of the Circula-		Influenza	239
tion	1,130	Convulsions	187
Measles	254	Inflammation of Brain	173
Debility, Inanition	665	Insanity.....	198
Cirrhosis of the Liver ...	127	Bright's Disease	157

In exhibiting the Vital Statistics for the year 1900, we are restricted by the fact that we possess, at present, only the aggregate population for Manchester and its Sanitary Divisions, not divided according to sex and age. We have, therefore, kept the division of populations continuous with previous intercensal figures, retaining the figures prepared before the Census. The error thus introduced into the death-rate is small, and no accurate figure is attainable; but a very material error would be introduced if, having the new Census figures, we should adhere, for the Sanitary Districts of the City, to our estimated population. Fresh estimates have, therefore, been made of the population living in each of those divisions at the middle of the year 1900, on the supposition that the populations have increased or decreased at a uniform rate.*

The number of persons married in the Manchester, Chorlton, and Prestwich Unions gives a rate of 18·0 per thousand of the population.

The birth-rate for Manchester was 31·88 and the death-rate 23·42 per 1,000. If, however, we recalculate the population on the basis of the Census figures the birth-rate becomes 32·37 and the death-rate 23·78. The marriage-rate is apparently governed by the prosperity of the community, which finds expression largely in the value of the exports. According to Dr. Ogle, a rise or fall in the exports is followed by a rise or fall in the marriage-rate after an interval of one year.

How far this is the case may be seen from the following figures, which give the value of the exports from Great Britain and Ireland since 1865, and the birth-rate for England and Wales beginning with the same year.

* See Table H at end of report.

TABLE 2.—SHOWING THE MARRIAGE, BIRTH, AND DEATH RATES IN ENGLAND AND WALES, WITH THE TOTAL VALUE OF EXPORTS OF BRITISH AND IRISH PRODUCTS, FOR THE YEARS 1865-99.

Year	Population England & Wales	Rate to 1,000 Persons living			Births less Deaths per 1,000	Value of Exports in £ Millions	Year
		Marriages	Births	Deaths			
1865	21,145,151	17·5	35·4	23·2	12·2	166	1865
1866	21,409,684	17·5	35·2	23·4	11·8	189	1866
1867	21,677,525	16·5	35·4	21·7	13·7	181	1867
1868	21,948,713	16·1	35·8	21·8	14·0	179	1868
1869	22,223,299	15·9	34·8	22·3	12·5	190	1869
1870	22,501,316	16·1	35·2	22·9	12·3	200	1870
1871	22,788,594	16·7	35·0	22·6	12·4	223	1871
1872	23,096,495	17·4	35·6	21·3	14·3	256	1872
1873	23,408,556	17·6	35·4	21·0	14·4	255	1873
1874	23,724,834	17·0	36·0	22·2	13·8	240	1874
1875	24,045,385	16·7	35·4	22·7	12·7	223	1875
1876	24,370,267	16·5	36·3	20·9	15·4	201	1876
1877	24,699,539	15·7	36·0	20·3	15·7	199	1877
1878	25,033,259	15·2	35·6	21·6	14·0	193	1878
1879	25,371,489	14·4	34·7	20·7	14·0	192	1879
1880	25,714,288	14·9	34·2	20·5	13·7	223	1880
1881	26,046,142	15·1	33·9	18·9	15·0	234	1881
1882	26,334,942	15·5	33·8	19·6	14·2	242	1882
1883	26,626,949	15·5	33·5	19·6	13·9	240	1883
1884	26,922,192	15·1	33·6	19·7	13·9	233	1884
1885	27,220,706	14·5	32·9	19·2	13·7	213	1885
1886	27,522,532	14·2	32·8	19·5	13·3	213	1886
1887	27,827,706	14·4	31·9	19·1	12·8	222	1887
1888	28,136,258	14·4	31·2	18·1	13·1	234	1888
1889	28,448,239	15·0	31·1	18·2	12·9	249	1889
1890	28,763,673	15·5	30·2	19·5	10·7	263	1890
1891	29,081,962	15·6	31·4	20·2	11·2	247	1891
1892	29,401,898	15·4	30·5	19·0	11·5	227	1892
1893	29,725,358	14·7	30·8	19·2	11·6	218	1893
1894	30,052,397	15·1	29·6	16·6	13·0	216	1894
1895	30,383,047	15·0	30·4	18·7	11·7	226	1895
1896	30,717,355	15·8	29·7	17·1	12·6	240	1896
1897	31,055,355	16·0	29·7	17·4	12·3	234	1897
1898	31,397,078	16·3	29·4	17·6	11·8	232	1898
1899	31,742,588	16·5	29·3	18·3	11·0	264	1899

It will be seen that while the above statement is nearly correct, the correspondence between the magnitude of the exports and the height of the marriage-rate is not very close. That is probably dependent on the factor introduced by internal trade and good or bad harvests.

As regards Manchester, it will be seen that the marriage-rates in 1896, and again in 1898 and 1899, were higher than in any year since 1882. If we take this to indicate increased prosperity, and if we assume that the interval necessary for the prosperity of the city to affect the marriage-rate is one year, we must assume that the prosperity of previous years had begun to wane in 1899.

When we pass from the marriage-rate to the birth-rate we observe that, whether we take the country as a whole or the City of Manchester in particular, there is a steady decrease in the birth-rate, whatever the fluctuations of the marriage-rate may be. No obvious relation exists between the two rates, and it would seem from the figures as if there were some causes at work producing a lowered birth-rate other than variations in the prosperity of the community. Amongst these have been mentioned the lowered death-rate and an increasing tendency to avoid the production of children. Assuming that the latter tendency exists, it may arise from a higher standard of comfort being adopted, and partly also from the increasing expense incurred in equipping children for the struggle. Supposing there were no emigration or immigration, the annual increase of the population is represented by the number of births less the number of deaths during the year. How does this stand? If we refer to the excess of births over deaths we perceive that in the latter half of the past decade this excess has increased. At the same time, emigration has considerably diminished and immigration has probably not diminished. Hence, in spite of a diminishing birth-rate, there has been a larger natural increase of the population in recent years. But the natural increase is less than in the previous decade, and this in turn is less than the natural increase during the years 1871-81. Still, the growth of the population is not lessened to nearly the extent that the birth-rate is, a fact which no doubt reacts on the birth-rate.

Amongst the factors which determine the prosperity and health of the community are the prices of food and fuel. It will be seen from the following

table that though the prices of the staple articles of food have not increased, coal has become much dearer. It cannot be said that the figures showing paupers relieved have undergone a corresponding increase :—

TABLE 3.—TOWNSHIP OF MANCHESTER.—PRICES PAID BY THE GUARDIANS FOR FLOUR, BUTCHERS' MEAT, AND COAL; ALSO THE AVERAGE NUMBER OF PERSONS IN RECEIPT OF RELIEF DURING THE YEARS 1887–1900.

YEAR ENDING	PRICES OF PROVISIONS							PAUPERISM		BIRTH- RATE PER 1,000
	Flour per Sack of 280lbs.	Butchers' Meat, per lb.		Coal, per ton		Average number of Paupers relieved in each week				
		Beef		Mutton	Engine	House	Indoor	Outdoor		
		Coarse	Fine							
1887	25/2 to 30/6	-/3 $\frac{3}{4}$	-/6 $\frac{1}{2}$	-/6 $\frac{1}{2}$	5/6	8/4	3123	877	33·9	
1888	24/- to 29/3	-/3 $\frac{3}{4}$	-/6 $\frac{1}{2}$	-/6 $\frac{1}{2}$	5/5	8/3	3130	713	33·3	
1889	24/11 to 31/2	-/4 $\frac{1}{2}$	-/6 $\frac{1}{2}$	-/6 $\frac{1}{2}$	5/8	8/7	3037	632	33·1	
1890	24/9 to 29/11	-/5	-/7	-/7	7/-	9/9	2998	498	31·8	
1891	27/3 to 28/11	-/4 $\frac{1}{4}$	-/6 $\frac{1}{2}$	-/6 $\frac{1}{2}$	8/8	11/2	3118	466	33·8	
1892	26/4 to 28/5	-/4	-/6 $\frac{1}{4}$	-/6 $\frac{1}{4}$	7/6	10/2	3251	551	33·4	
1893	21/8 to 25/1	-/3 $\frac{7}{8}$	-/6 $\frac{1}{4}$	-/6 $\frac{1}{4}$	6/5	10/0	3277	586	33·4	
1894	17/2 to 23/9	-/3 $\frac{3}{4}$	-/6	-/6	7/1	10/10	3328	395	31·8	
1895	15/6 to 21/-	-/3 $\frac{3}{4}$	-/6	-/6	5/6	10/3	3343	618	33·4	
1896	16/6 to 24/-	-/3 $\frac{5}{8}$	-/5 $\frac{3}{4}$	-/5 $\frac{3}{4}$	5/7	9/1	3348	533	32·8	
1897	17/3 to 33/9	-/3 $\frac{1}{2}$	-/5 $\frac{5}{8}$	-/5 $\frac{5}{8}$	5/9	8/8	3476	697	32·9	
1898	26/7 to 33/8	-/3 $\frac{1}{2}$	-/5 $\frac{1}{2}$	-/5 $\frac{1}{2}$	6/2	8/4 $\frac{1}{2}$	3519	732	32·3	
1899	20/11 to 23/-	-/3 $\frac{1}{2}$	-/5 $\frac{5}{8}$	-/5 $\frac{5}{8}$	7/5	9/11	3232	597	32·2	
1900	20/9 to 22/9	-/3 $\frac{1}{2}$	-/5 $\frac{1}{2}$	-/5 $\frac{5}{8}$	11/9 $\frac{3}{4}$	14/2 $\frac{1}{2}$	3189	686	32·4	

Although, however, no indication of increasing poverty is to be found in the proportion of persons seeking relief, the high proportion of persons dying in public institutions may be taken as indicating distress. The proportion to all deaths is 21·9 per cent., which is in excess of any previous year. To some extent this may be due to the number of persons suffering from arsenical poisoning. The details are given in the following table. On comparing this

table with the corresponding table given in former Annual Reports, it will be seen that the great increase in the percentage of deaths occurring in institutions consists in a great increase of deaths in the Workhouse Hospitals, especially in Withington Workhouse :—

TABLE 4.—POPULATIONS—DEATHS OF MANCHESTER RESIDENTS,
1900, IN PUBLIC INSTITUTIONS.

Township	NAME OF INSTITUTION	Population, 1891	Deaths, 1900
ANCOATS	Ancoats Hospital	64	128
	Workhouse Casual Wards (Tame Street).....	...	1
	Workhouse Casual Wards	167	3
	Royal Infirmary	260	268
	St. Mary's Hospital	27	23
	Lock Hospital	25	1
CENTRAL	Eye and Ear Hospital	7	2
	Alsop's Boys' Home.....	11	...
	St. Joseph's Girls' Home.....	17	...
	Chetham Hospital.....	100	...
	Mission Refuge (St. John's Parade)	8	...
	Consumption Hospital.....	...	...
ST. GEORGE'S ...	Children's Hospital (Gartside Street).....	...	...
	Girls' Home (Charter Street)	21	...
CHEETHAM ...	Her Majesty's Prison	922	6
	Boys' Refuge	185	...
	Girls' Friendly Society	18	..
	Clinical Hospital	36	103
CRUMPSALL ...	Fairy Hill Home for Working Lads .....	...	...
	Manchester Workhouse	2,608	960
BLACKLEY	Prestwich Workhouse	305	164
	Manchester and Salford Reformatory	76	...
	Litchford Hall	152	6
MOSTON	Well's House Convalescent Home.....	10	...
	St. Mary's Home .....	...	1
	St. Joseph's Home	34	...
NEWTON.....	St. Bridget's Orphanage	32	...
	Monsall Hospital	185	162
CLAYTON	Little Sisters of the Poor (Culcheth Hall) ...	107	12
	Clayton Smallpox Hospital .....	..	...
ARDWICK	Industrial School	203	...
	Nicholls Hospital	100	1
OPENSHAW	Crossley's "Home of Peace".....	...	24
RUSHOLME.....	St. Joseph's Girls' School	150	...
	St. Mary's Home	28	...
	St. Joseph's Boys' School	413	..
CHORLTON-ON-MEDLOCK	Royal Eye Hospital	59	...
	Little Sisters of the Poor (Plymouth Grove)...	182	24
	Casual Wards (All Saints)	21	...
	Southern Hospital	23	11
	Cancer Hospital	19	17
	Maternity Home	11	8
	Home for Young Girls.....	18	...
	Rylands' Orphanage.....	17	...
	Church Army Labour Home	20	...
	Penitentiary	51	...
HULME	Cavalry Barracks	404	3
	Boys' Home (Chester Road)	20	...
	Loretto Convent .....	...	...
* <u>OUTSIDE CITY.</u>	Withington Workhouse	1,375	825
	Pendlebury Hospital	50	40
	Prestwich Lunatic Asylum	755	33
	St. Anne's Home, Dunham Massey .....	...	2
	Mauldeth Hall .....	...	3
	Eccles and Patricroft Hospital .....	...	1
TOTALS.....		9,296	2,832

* Proportion only.

The death-rate of the city for the year 1900 is higher than the average for the previous nine years by 0·4 per 1,000, which represents about 220 additional deaths in the year.

The chief causes of death are given on page 3 of the Statistics. As usual, chest diseases and consumption are the heaviest items, and account for more than one-third of the deaths. Diseases of the circulation come next, while diarrhœa again stands out conspicuous with 808 deaths. The number of deaths from cirrhosis of the liver is unusually large, and there are as many as 239 deaths from influenza.

The principal gains and losses in 1900 as compared with the previous nine years are exhibited in the following table;—

Gains in 1900 per 1000 persons living.

Measles	0·32
Scarlet Fever.....	0·04
Diphtheria.....	0·01
Enteric Fever	0·08
Puerperal Fever	0·02
Rheumatic Fever	0·03
Tubercular Disease other than Phthisis	0·14
Old Age.....	0·06
Brain and Nervous Diseases	0·17
Other Respiratory Diseases.....	0·09
Urinary Organs.....	0·03
<hr/>	
Total	0·99

Losses in 1900.

Whooping Cough.....	0·11
Influenza	0·15
Diarrhœa	0·11
Rickets	0·04
Cancer	0·09
Premature Birth	0·02
Heart Diseases	0·28
Bronchitis	0·07
Pneumonia	0·55
Digestive Organs	0·10
<hr/>	
Total	1·52
<hr/>	
Balance of Loss	0·53

On these items there is a balance of loss equal to 0·53 per 1,000, or a total of 292 deaths, over the average deaths on a population of 550,000.

The chief gains were in measles, brain and nervous diseases, tubercular disease other than phthisis, respiratory disease, and enteric fever. The gain under measles is a temporary and unstable quantity. That shown under tubercular diseases may be accidental, but may also be due in some measure to the operation of the milk clauses.

The heavy loss of the year, which is more than the total balance of loss, is sustained under pneumonia, a disease which must be taken along with influenza, which also gives a considerable adverse balance.

Heart diseases show also a high loss which is due partly, no doubt, to influenza and respiratory disease, partly it may be to the outbreak of arsenical poisoning. In this connection it may be mentioned that there is a loss under digestive diseases.

The detailed statement of the mortality rates from different causes will be found under tables F and G.

From these it will be seen that the death-rate from scarlet fever, though low as compared with the average, is more than double the death-rate from this cause in 1899. The death-rate from diphtheria is also low, but increasing. From whooping cough the death-rate is higher than in any year since 1892. From enteric fever it is about the same as in 1899, and is, with the exception of that year, the lowest on record. From diarrhoea and dysentery it is very high, but not so high as in 1897, 1898, or 1899. Diarrhoea is pre-eminently a filth disease, though seasonal changes have much to do with its fluctuations.

Cancer, again, shows an increased death-rate. From phthisis the death-rate is nearly the average of the preceding nine years. From other forms of tuberculosis, as already mentioned, there is a decrease. The increase in the mortality from respiratory disease and from heart disease has already been mentioned: it is the chief feature of the year. The subject of the great fatality in Manchester from respiratory and heart disease has been discussed in previous reports. So far as can be gathered from the statistics, the excess is connected rather with unhealthy modes of life and insanitary dwellings than with atmospheric conditions, although, no doubt, atmospheric impurities have a share in its production.

EFFECT OF AGE ON THE DEATH-RATE.

As the rearrangement of the population into minor groups living at certain ages has not yet been received, the death-rates at different age groups, as

shown in the following table, have been calculated on figures obtained from the Census of 1881 and the Census of 1891 :—

TABLE 5.—ANNUAL RATES OF MORTALITY IN MANCHESTER IN THE YEAR 1900 AT TWELVE GROUPS OF AGES
AMONGST PERSONS, MALES AND FEMALES, COMPARED WITH THE AVERAGE RATE AT THOSE AGES IN MANCHESTER
1891-1899, AND ENGLAND AND WALES DURING THE DECENNIUM 1881-90.

	PERSONS			MALES			FEMALES		
	Manchester Average, 1891-1899	Manchester, 1900	England and Wales, 1881-90	Manchester Average, 1891-1899	Manchester, 1900	England and Wales, 1881-90	Manchester Average, 1891-1899	Manchester, 1900	England and Wales, 1881-90
All Ages	23·02	23·42	19·17	24·33	25·08	20·28	21·01	21·89	18·06
0—	78·36	72·74	56·77	83·80	77·99	61·59	73·05	67·61	51·95
5—	5·14	5·12	5·31	4·91	5·39	5·35	5·37	4·86	5·27
10—	2·73	2·50	3·04	2·84	2·58	2·96	2·62	2·43	3·11
15—	4·23	3·58	4·38	4·68	3·98	4·33	3·81	3·21	4·42
20—	5·34	5·76	5·64	5·93	6·64	5·73	4·81	4·98	5·54
25—	8·31	8·56	7·20	8·86	9·00	7·78	7·80	8·15	7·41
35—	15·83	18·48	11·51	17·92	20·38	12·41	13·84	16·67	10·61
45—	25·95	31·08	17·23	30·53	36·81	19·36	21·86	25·98	15·09
55—	49·25	58·28	31·57	56·19	64·05	34·69	43·62	53·63	28·45
65—	95·00	105·24	65·38	108·29	116·91	70·39	85·88	97·23	60·36
75—	208·55	235·24	138·88	232·73	254·53	147·14	194·20	223·79	130·62
85—	295·86	300·00	288·32	323·61	452·05	305·81	282·84	229·30	270·82

NOTE.—Calculated on the old estimated population.

It will be seen from the first column that the mortality at ages 0-5 has been considerably lower than in the preceding 9 years, in spite of the high death-rate from diarrhoea. The death-rate at ages 5-10 is also lower. At ages 10-15 and 15-20 there is a marked difference in favour of 1900. After this, at every age group, the balance is decidedly adverse to this year. Thus in infancy and at the period of school life the death-rate is comparatively low; at all ages above 20 it is comparatively high. Both influenza and the outbreak of arsenical poisoning are capable of producing this difference. But the degree of difference is altogether beyond what the latter cause alone could be accountable for.

The mortality rate of infants is usually reckoned as the number of deaths of infants under one year of age per 1,000 births. Referring to Table J, we find that out of 1,000 illegitimate children born in 1900, 432 died, while out of the same number of legitimate children 179 died. The death-rate of illegitimates is thus much more than double the death-rate of legitimate children.

Fortunately, the percentage of children born out of wedlock is only 3·8, the lowest percentage since 1893.

The total number of deaths under one year of age in 1900 per 1,000 children born is 188·7, which is lower than in any year since 1896, chiefly on account of the differences introduced by diarrhoea; but it is also lower than the infantile death-rate in 1895, 1893, and 1891, although the diarrhoea death-rate is higher than in those years.

I feel it necessary to insist on the continued high death-rate of the past four years from Summer diarrhoea, as it indicates a neglect of cleanliness and an inattention to the welfare of infants which is truly deplorable, and needs interference.

There are, however, important diseases in this table other than diarrhoea. It may be noted with some satisfaction that the infantile tubercular death-rate is lower than in any previous year of which we have a record. Owing, however, to the uncertainty of diagnosis in this class of disease, it would be unwise to make too much of this fact. Another infantile death-rate on which some stress has been laid is that from convulsions, since this may fairly be associated with infant feeding. This death-rate is somewhat higher than in 1899, but is much lower than in any preceding year, which seems to indicate, spite of the high death-rate from diarrhoea, that the continued instructions given to mothers in infant feeding for a number of years is bearing fruit.

INFLUENCE OF SEX ON THE DEATH-RATE.

It will be seen from the figures on page 1 that the number of females exceeds by about 20,000 the number of males in the population.

The number of male children born in the year 1900 exceeds the number of female children, and if we compare one year with another we perceive that this excess of male children is regular. Quite as regular is the excess in the number of deaths in males over that in females.

If we turn to Table 5 we find that this excess of mortality in males holds for every age, though much more marked after the age of 20. In the case of all England, however, there is one period of life, viz., the school age (10-15), when boys have a lower death-rate than girls. It would appear, then, that males are more easily destroyed by disease than females in infancy, and that, owing to the harder occupations which they pursue, and perhaps owing to their different habits, they die more rapidly than females in adult life.

DEATH-RATES IN GROUPS OF CIVIL PARISHES.

From Table 6 it appears that only in Cheetham, Crumpsall, and Moston does the comparative mortality figure fall below that of England and Wales generally.

TABLE 6.—1900.—RECORDED AND CORRECTED DEATH-RATES PER 1000 PERSONS LIVING IN GROUPS OF CIVIL PARISHES.

Groups of Civil Parishes in the Sub-Districts of Manchester, arranged in order of their corrected Death-rates	* Standard Death- rate	† Factor for correction for Sex and Age Dis- tribution	Recorded Death- rate, 1900	‡ Corrected Death- rate, 1900	§ Compar- ative Mortality Figure
Cheetham and Crumpsall	17·91	1·0693	14·27	15·26	833
Moston	17·72	1·0807	15·04	16·25	888
Blackley and Harpurhey	17·16	1·1157	17·27	19·27	1,052
Clayton	17·71	1·0815	19·71	21·32	1,164
Ardwick, Openshaw, } West Gorton, and } Rusholme	16·81	1·1374	21·13	24·03	1,312
Newton Heath, Brad- } ford, Beswick, and } Kirkmanshulme ... }	17·08	1·1211	21·46	24·06	1,314
Chorlton-upon-Medlock.	16·29	1·1755	22·27	26·17	1,429
Hulme	16·93	1·1309	27·75	31·38	1,714
Ancoats	16·83	1·1381	29·19	33·22	1,814
St. George's	16·89	1·1340	30·71	34·83	1,902
Central	16·25	1·1782	32·67	38·49	2,102
England and Wales ...	19·15	1·0000	18·31	18·31	1,000

* The standard death-rate signifies the death-rate at all ages calculated on the hypothesis that the rates at each of twelve age periods in each town were the same as in England and Wales during the ten years 1881-90, the death-rate at all ages in England and Wales during that period having been 19·15 per 1000.

† The factor for correction $\left\{ = \frac{19·15}{\text{Standard death-rate}} \right\}$ is the figure by which the recorded death-rate should be multiplied in order to correct for variations of sex and age distribution.

‡ The corrected death-rate is the recorded death-rate multiplied by the factor for correction.

§ The comparative mortality figure represents the corrected death-rate in each town compared with the recorded death-rate at all ages in England and Wales in 1900 taken as 1000.

DISTRIBUTION OF THE POPULATION IN SANITARY DISTRICTS, AND THE DEATH-RATES IN THESE.

As already explained, in calculating the mortality statistics for the different Sanitary Divisions of the City, we should be entirely aside of the facts if we were to accept the populations as calculated from the Census figures of 1881 and 1891. We have, therefore, calculated the populations in 1900 from the figures of 1891 and 1901, and these are shown on Table 8. But, in order that the Sanitary Authority may see how completely astray we should go if we were to rely for 10 years on calculations based on two previous Census takings, and, therefore, how important it is to get an enumeration of the population every five years, I have left the calculations based on the two previous Censuses side by side with those obtained from recent figures. See also Tables H at end of report.

TABLE 7.—1900.—DEATH-RATES* IN THE HOMES OF THE PEOPLE, IN WORKHOUSES, AND IN HOSPITALS FOR THE VARIOUS DIVISIONS OF THE CITY, CALCULATED ON THE CENSUS OF 1881 AND 1891.

STATISTICAL DIVISIONS	Estimated Popula- tions	Death-rate per 1000 of persons dying in their own homes	Death-rate per 1000 of persons dying in Work- houses	Death-rate per 1000 of persons dying in Hospitals	Total death-rate per 1000
City of Manchester ...	† 550,864	18·28	3·55	1·60	23·42
I. Manchester Township	144,139	19·91	6·65	2·42	28·98
II. Northern Districts ...	150,889	17·48	1·09	1·35	19·92
III. Southern Districts ...	255,836	17·84	3·24	1·28	22·36
I. { Ancoats	44,956	21·64	5·05	2·67	29·36
{ Central	35,095	17·78	8·75	2·51	29·04
{ St. George's	64,088	19·86	6·62	2·20	28·68
II. { Cheetham	32,023	14·36	1·31	1·31	16·99
{ Crumpsall	10,662	9·94	0·94	0·84	11·72
{ Blackley	8,433	15·42	0·71	1·30	17·43
{ Harpurhey	13,916	18·32	0·72	1·22	20·26
{ Moston	7,358	21·61	0·41	0·95	22·97
{ Newton Heath	38,423	17·02	0·96	1·46	19·44
{ Bradford	24,214	20·69	1·40	1·61	23·71
{ Beswick	11,349	20·97	1·32	1·32	23·61
{ Clayton	4,511	29·71	1·77	1·55	33·03
III. { Ardwick	38,469	21·29	2·08	1·87	25·24
{ Openshaw	34,367	14·69	1·43	1·02	17·14
{ West Gorton	29,016	18·47	1·96	1·28	21·71
{ Rusholme and Kirk.	20,495	14·88	1·02	0·98	16·88
{ Chorlton-on-Medlock	62,319	15·24	4·44	1·20	20·89
{ Hulme	71,170	20·36	4·86	1·24	26·46

* In this table, *every death* occurring in a Public Institution has been referred to the District from which the patient originally came.

† Population estimated to middle of 1900 on old population.

TABLE 8.—1900.—DEATH-RATES * IN THE HOMES OF THE PEOPLE, IN WORKHOUSES, AND IN HOSPITALS FOR THE VARIOUS DIVISIONS OF THE CITY, CALCULATED ON THE CENSUS OF 1891 AND 1901.

STATISTICAL DIVISIONS	Estimated Populations	Death-rate per 1000 of persons dying in their own homes	Death-rate per 1000 of persons dying in Work-houses	Death-rate per 1000 of persons dying in Hospitals	Total death-rate per 1000
City of Manchester....	† 542,566	18·56	3·60	1·62	23·78
I. Manchester Township	136,260	21·06	7·03	2·56	30·65
II. Northern Districts ...	159,709	16·51	1·03	1·27	18·82
III. Southern Districts ...	246,597	18·51	3·37	1·33	23·20
I. { Ancoats	45,224	21·51	5·02	2·65	29·19
Central	31,194	20·00	9·84	2·82	32·67
St. George's	59,842	21·27	7·09	2·36	30·71
II. { Cheetham	37,371	12·31	1·12	1·12	14·56
Crumpsall	8,512	12·45	1·17	1·06	14·69
Blackley	8,908	14·59	0·67	1·23	16·50
Harpurhey	14,884	17·13	0·67	1·14	18·95
Moston	11,239	14·15	0·27	0·62	15·04
Newton Heath	36,496	17·92	1·01	1·53	20·47
Bradford	23,297	21·50	1·46	1·67	24·64
Beswick	11,442	20·80	1·31	1·31	23·42
Clayton	7,560	17·72	1·06	0·93	19·71
III. { Ardwick	40,766	20·09	1·96	1·77	23·82
Openshaw	26,841	18·81	1·83	1·30	21·94
West Gorton	27,442	19·53	2·08	1·35	22·96
Rusholme and Kirk..	25,221	12·09	0·83	0·79	13·72
Chorlton-on-Medlock	58,476	16·25	4·74	1·28	22·27
Hulme	67,851	21·36	5·10	1·30	27·75

* In this table, *every death* occurring in a Public Institution has been referred to the District from which the patient originally came.

† Population estimated to middle of 1900 on new Census population.

It will be seen that the population of the Manchester Township by the new estimate is about 8,000 less, that of the Northern Districts about 9,000 more, and that of the Southern Districts over 9,000 less than by the estimate based on the Census figures of 1881 and 1891.

The districts which show a population much less than that given by previous Census figures are Central and St. George's in the Manchester Township; Openshaw, Chorlton, and Hulme in the Southern Division.

To a smaller extent an error in the same direction is noticeable in Crumpsall, Newton Heath, Bradford, Openshaw, and West Gorton.

On the other hand, the population of the following districts has increased much beyond what previous Census figures indicated:—Cheetham, Harpurhey, Moston, Clayton, Ardwick, and Rusholme.

The effect of these changes is to produce great alterations in the death-rates of the various districts, although as regards the main purpose of Table 7, which is to indicate the relative extent of the death-rates sustained at home, in the Union Hospitals, and in Charitable Institutions, practically no alteration arises.

As regards the three chief divisions of the City, the effect of the new figures is to intensify the differences between the three main divisions of the City and very considerably to raise the death-rates of the Central and St. George's Districts. It is here that the effect of the common lodging-houses is chiefly felt. The death-rate in Hulme is also raised, and is by far the highest of any district outside the Manchester Township.

After Hulme, the highest mortality is found in Bradford, Beswick, Ardwick, and West Gorton.

The mortality rate of persons dying in the Workhouse Hospital is by far the greatest in the Central and St. George's Districts, then in Hulme and Ancoats, and, after these, in Chorlton-on-Medlock. It is in these districts, then, that actual want takes a large share in the production of the death-rate. The proportion of deaths occurring in the Union Hospitals in other districts is much smaller.

In the Central District between one-third and one-quarter of all deaths occur in the Workhouse, and between one-half and one-third occur in public institutions. In St. George's the proportion is somewhat smaller.

We practically eliminate the common lodging-house element, as well as much of the deepest poverty, when we consider only the deaths occurring at home. The death-rate taken on this basis is probably the best index of the sanitary condition of the districts, considered separately from social factors. On this basis the most insanitary districts in order are Ancoats, Bradford, Hulme, St. George's, and Beswick.

It will be seen that, as in previous years, Bradford stands out conspicuous, and I consider that a house to house inspection is required in this district. Taking the home death-rate, the lowest figures are to be found in Rusholme, Cheetham, Crumpsall, Moston, and Blackley; the same result is given by the aggregate death-rates.

Further comparative statistics are given in Tables H, J, K, and L. Tables H show the density of population per acre, the birth-rates and the death-rates of the respective districts. From this we see that while, in general, the districts having the largest number of persons per acre have also the highest death-rates, the relation is neither a close nor an unvarying one. It requires interpretation. As in former years, the birth-rate is highest over an industrial district, including Harpurhey, St. George's, Ancoats, Beswick, Bradford, Clayton, Openshaw, Ardwick, and West Gorton. From Table J we perceive that illegitimate deaths are much less numerous in the Northern than in the other districts of the City. They are relatively frequent in Chorlton-upon-Medlock, the Central District, St. George's, and Hulme.

Table K showing the infantile mortality in the three divisions, presents the usual features. The infantile mortality is much higher in the Manchester Township than in the Southern Districts, and much higher in the Southern than in the Northern Districts. This is true likewise of diarrhoea, convulsions, wasting diseases, and in respect of children found dead in bed. That is to say, it is true of that group of causes of death which indicate dirt and neglect. It is not true of the doubtful group known as tubercular disease, from which the death-rate is, as usual, much the highest in South Manchester.

From lung diseases, again, the mortality, much the highest in the Manchester Township, is higher in North than in South Manchester. If we turn to Table L, which allows of a comparison between the death-rates at all ages of the three principal divisions of the City, we find that as regards a large group of diseases depending on insanitary conditions such as poverty, dirt, crowding, and injurious personal habits—viz., for phthisis, pneumonia, heart disease, and bronchitis—the death-rates in the Manchester Township are much higher than in the Southern Districts, and are much higher in the Southern than in the Northern Districts. From measles, on the other hand, the highest mortality for 1900 was in North Manchester, then in South Manchester.

The same is true for scarlet fever.

From diphtheria the highest death-rate was in North Manchester, then in the Manchester Township. From whooping cough it was highest in the Manchester Township.

From enteric fever it was equally distributed.

No fixed law is observable in regard of these diseases, the prevalence of which is determined by several factors.

On referring to Table N, it will be seen that the largest proportion of deaths requiring an inquest is in the Manchester Township, and that in the Central District 11·4 per cent. of all deaths were certified by the Coroner. The same district also contains the largest proportion of uncertified deaths. Special vigilance is needed to ensure that deaths, especially in the Manchester Township, shall not escape without a knowledge of the cause of death.

INFECTIOUS DISEASES.

The diseases included in the Infectious Disease (Notification) Acts, 1889 and 1899, are as follows: Smallpox, Scarlet Fever, Diphtheria, Membranous Croup, Typhus Fever, Enteric or Typhoid Fever, Relapsing Fever, Continued Fever, Puerperal Fever, Erysipelas, and Asiatic Cholera. The following cases were notified in 1900 and in the nine previous years, and the year 1900 is compared with the average of the previous nine years. To the above diseases must be added, for the year 1900, Plague:—

	1891	1892	1893	1894	1895	1896	1897	1898	1899	Aver'ge for 9 Years	1900
Smallpox	2	118	607	282	51	1	...	...	2	118	3
Scarlet Fever ...	1,138	1,671	2,031	2,230	2,302	2,389	1,790	897	1,467	1,768	2,507
Diphtheria	456	497	622	512	402	239	150	196	248	369	337
Memb. Croup }											
Typhus Fever ...	16	6	1	...	...	1	2	...	3	3	*5
Enteric Fever ...	761	610	618	460	493	513	503	642	381	553	378
Relapsing Fever	4	...	...	...	...	...	...	...	...	...	...
Puerperal Fever	55	92	93	51	33	25	49	44	35	53	49
Erysipelas .....	...	...	...	...	...	...	...	...	...	...	177
	2,432	2,994	3,972	3,535	3,281	3,168	2,494	1,779	2,136	2,886	3,456

* There were a number of cases overlooked, and not notified, which were traced by the Medical Officer of Health after the patients had recovered.

The number of deaths for ten years from the more common diseases is shown in the following table, 1900 being compared with the average:—

From	1891	1892	1893	1894	1895	1896	1897	1898	1899	Aver'ge for 9 Years	1900
Measles	220	369	293	222	505	567	628	271	699	419	254
Scarlet Fever ...	114	139	140	116	173	198	124	65	46	124	105
Diphtheria	122	91	122	102	72	54	29	41	71	78	76
Memb. Croup ...	6	39	60	47	41	29	17	10	14	29	25
Enteric Fever ...	189	124	127	91	95	118	95	120	73	115	75
Smallpox .....	...	2	49	21	2	...	...	...	...	8	...
Influenza	347	140	120	45	194	53	107	64	219	143	239
Whooping Cough	518	368	240	286	250	359	299	170	227	302	371
	1,516	1,272	1,151	930	1,332	1,378	1,299	741	1,349	1,219	1,145

From the Summary on the preceding page it will be seen that the number of cases of disease notified under the Infectious Disease Notification Acts in 1900 exceeded the number notified in any one of the previous five years. This is mainly due to the ascent of the periodic wave of Scarlet Fever, the last completed wave having occupied a period of eight years. Diphtheria, however, also showed an increase on the preceding four years. Enteric Fever reached the lowest point hitherto attained.

As regards deaths from infectious disease, the number of deaths from Measles was considerably lower than in 1899. This diminution coincided with a cessation in the closing of schools by the Sanitary Authority, but has relation chiefly to the large number of deaths in 1899.

From Whooping Cough, on the other hand, another disease largely spread in schools, the number of deaths was greater than in any year since 1891.

From Influenza, again, a disease which exacts an indirect mortality higher than that directly ascribed to the disease, the number of deaths is greater than in any year since 1891.

This high mortality was experienced chiefly in the first quarter of the year.

From Scarlet Fever and Diphtheria not only was the number of cases notified greater than in 1899, but the type of disease was more severe. The type of disease was also more severe in the case of Enteric Fever.

Nevertheless, owing to the large part played by Measles in the production of the zymotic mortality, the total number of deaths from zymotic disease was considerably less in 1900 than in 1899.

SMALLPOX.

There were only three cases of Smallpox notified during the year 1900.

The first case, male *æt.* 26, vaccinated in childhood, was notified on the 7th of May, and removed to Clayton Hospital the same day. The patient was a traveller, and had been working Yorkshire towns since April 18th. He wrote home on May 1st complaining of being ill, and stated that he had pains in the back and stomach, and also on the following day. Returned home on the 3rd, and had a bath, when the rash was observed on his body. Eruption discrete. Discharged June 15th.

The second case, male *æt.* 26, unvaccinated, was notified on the 8th June, and removed to Clayton Hospital same day. This patient left Canada on the 10th May, and arrived in Liverpool on May 23rd. He then went to Preston for 14 days, and arrived in Manchester on June 5th, when he complained of feeling ill. Eruption confluent. Discharged on July 29th. Illness probably contracted in Liverpool.

The third case, female æt. 23, was notified on the 15th June, and was removed to Clayton Hospital the same day. The illness was probably contracted at Middleton. The eruption appeared on the 12th June, was only slight, and was confined to the face. Vaccinated 23 years ago when an infant. One faint mark on left arm. Eruption discrete. Discharged July 17th.

Mr. Macdonald has kindly furnished me with the numbers of successful primary vaccinations performed by public vaccinators in the Manchester Township during the year 1900. These are :—

1st quarter	464
2nd ,, 	485
3rd ,, 	578
4th ,, 	392

It will be seen on comparing these figures with those of recent years that the number of vaccinations performed by the public vaccinators increased during 1900.

In addition to these cases, an attendant on the London and North-Western Railway began to be ill with Smallpox on April 20th, but went to London, where his illness became pronounced.

On the 20th April also a man arrived at Victoria Station by a Midland train from London, and was so ill that he had to be removed on a trolley from No. 5 Platform to No. 2 Platform for the Stalybridge train, where he resided. This person was travelling from Russia, where he had been working as a fitter. He was suffering from Smallpox, and died in Hyde Hospital. In connection with this case there were also cases at Bolton and Carlisle.

It will thus be seen that Manchester was invaded by Smallpox from four distinct sources in 1900, but fortunately the cases were recognised early, all due precautions were taken by way of re-vaccination of persons in contact, etc., and no further cases resulted.

Provision of a Smallpox Hospital.

On September 7th, 1898, the City Council resolved: "That the Corporation hereby undertake that, in future, cases of Smallpox will not be received or treated on any part of the Monsall Hospital site, and that the Town Clerk be authorised and instructed to transmit a copy of this resolution to the Local Government Board." This resolution was passed in consequence of the Local Government Board requiring such an undertaking before giving their sanction to a loan for the improvement of Monsall Hospital.

The only provision left for cases of Smallpox was the temporary Hospital at Clayton, which is quite inadequate to meet outbreaks such as occurred in 1893 and 1894.

The Sanitary Committee, having regard to their own experience in 1893 and 1894 and to the much more serious experiences of other towns in respect of Smallpox, considered it necessary to make due provision. They had already visited and approved of a site at Carrington Moss, and the Medical Officer of Health, having visited other suggested sites at Chat Moss and Moston, had come to the conclusion that this was, on the whole, the best site for the purpose.

The accommodation to be provided was settled on the basis of the experiences of 1893 and 1894, and the Medical Officer of Health was instructed to furnish the City Surveyor with an account of the hospital provision which would be required.

This accordingly, he did, and the City Surveyor prepared plans showing a hospital for 120 beds, but with an administrative block which would suffice for twice the number.

The estimated cost of the hospital was £60,000.

The proposed hospital having been sanctioned by the City Council, application was made to the Local Government Board for a loan, and an inquiry was held on the 14th, 15th, 16th, 17th, 19th, and 20th March, before Dr. Wheaton; Mr. Hudson appearing for the Corporation, and Mr. E. Sutton, Mr. W. W. Briggs, Mr. F. R. B. Lindsell, and Mr. W. Cobbett opposing the application.

In addition to the members and officers of the Corporation, the following gentlemen supported the scheme:—Professor J. Dixon Mann; Professor Julius Dreschfeld; Dr. John Robertson, Medical Officer of Health, Sheffield; and Dr. W. A. Evans, Medical Officer of Health, Bradford.

The scheme was very fully and ably argued by Mr. Hudson, and the opponents' case was also strongly represented.

It was rejected by the Local Government Board on technical grounds connected with the purposes for which the acquisition of the land had been originally sanctioned by the Board. This left it open to the Corporation to take the proposal to Parliament.

This was, however, prevented by the proposal being rejected at the Rate-payers' Meeting. The grounds of this rejection put forward in the press were the magnitude of the proposals and the site selected. There was, however, no reason to suppose that the Local Government Board objected to the site on sanitary grounds. It has in fact been ascertained that but for the technical objection above referred to the Board would have approved the scheme.

It remains necessary to make ampler provision for the treatment of Smallpox than we at present possess.

SCARLET FEVER.

Of the notifiable diseases, Scarlet Fever is, unquestionably, the most important.

The following are the tables relating to the occurrence of the disease, at different periods of the year, and in the different sanitary districts of the city, and to its severity in districts and at different ages.

TABLE 1.
SCARLET FEVER, 1900.—ATTACKS IN WEEKS ACCORDING TO DATE OF RASH.

FIRST QUARTER			SECOND QUARTER		THIRD QUARTER		FOURTH QUARTER				
Jan.	6	41	April	7	50	July	7	53	Oct.	6	62
„	13	48	„	14	43	„	14	39	„	13	61
„	20	59	„	21	37	„	21	45	„	20	74
„	27	47	„	28	28	„	28	47	„	27	65
Feb.	3	41	May	5	34	Aug.	4	53	Nov.	3	76
„	10	39	„	12	30	„	11	37	„	10	49
„	17	47	„	19	32	„	18	30	„	17	52
„	24	37	„	26	40	„	25	46	„	24	62
Mch.	3	33	June	2	50	Sept.	1	43	Dec.	1	61
„	10	45	„	9	48	„	8	75	„	8	50
„	17	50	„	16	35	„	15	66	„	15	56
„	24	50	„	23	35	„	22	57	„	22	52
„	31	41	„	30	46	„	29	53	„	29	57
Total...		578	Total...		508	Total...		644	Total...		777

City Total, 2507.

TABLE 2.
SCARLET FEVER ATTACKS, 1900.—RATES PER 1,000 LIVING, COMPARED WITH MEAN OF FIVE YEARS.

	1895	1896	1897	1898	1899	Mean	1900
Twelve Towns *	3·40	4·77	3·87	3·51	5·10	4·13	4·82
City of Manchester	4·37	4·42	3·34	1·66	2·69	3·30	4·62
Manchester Township	4·23	3·48	3·58	1·16	2·27	2·94	3·49
North Manchester	4·24	4·25	3·67	1·77	4·07	3·60	5·85
South Manchester	4·52	5·08	3·01	1·88	2·12	3·32	4·44

* These are Blackburn, Bolton, Bradford, Burnley, Huddersfield, Hull, Leeds, Liverpool, Oldham, Preston, Salford, and Sheffield.

TABLE 3.

1900—SCARLET FEVER ATTACKS IN DISTRICTS, WITH ATTACK RATE, CASE FATALITY PER CENT., AND REMOVALS TO HOSPITAL PER CENT.

DISTRICTS	ATTACKS	ATTACK RATE PER 1,000 LIVING	† CASE FATALITY PER CENT.	REMOVALS TO HOSPITAL PER CENT.
Ancoats	176	3·89	4·5	90·9
Central	97	3·11	7·2	91·9
St. George's	203	3·39	3·4	83·7
Cheetham	137	3·67	2·2	77·4
Crumpsall	34	3·99	...	70·5
Blackley	28	3·14	3·6	60·7
Harpurhey	146	9·81	2·7	74·0
Moston	109	9·70	0·9	65·2
Newton Heath.....	259	7·10	6·6	81·1
Bradford	127	5·45	7·9	85·6
Beswick	68	5·94	4·4	83·8
Clayton	27	3·57	...	66·7
Ardwick	193	4·73	4·1	87·0
Openshaw.....	136	5·07	0·7	78·7
Gorton (West)	172	6·27	6·4	81·4
Rusholme and Kirk.	141	5·59	2·1	72·3
Chorlton-on-Medlock.	167	2·86	3·6	78·5
Hulme	287	4·23	4·5	84·0
City of Manchester	2507	4·62	4·1	80·9

† Corrected : the fatal cases are those actually occurring amongst the cases notified.

TABLE 4.
SCARLET FEVER, 1900.

Number of attacks, of deaths, and case fatality per cent. at different ages :—

AGES	ATTACKS	DEATHS	CASE FATALITY PER CENT.
Under one year.....	21	4	19·1
1 to 2 years	91	13	14·3
2 to 3 „	124	13	10·5
3 to 4 „	213	16	7·5
4 to 5 „	263	23	8·7
5 to 6 „	252	10	4·0
6 to 7 „	231	6	2·6
7 to 8 „	207	5	2·4
8 to 9 „	178	1	0·6
9 to 10 „	175	1	0·6
10 to 15 „	487	5	1·0
15 to 20 „	156	3	1·9
20 to 25 „	55	2	3·6
25 to 35 „	43	...	...
35 to 45 „	6	1	16·7
Over 45 „	5	...	...
All ages.....	2507	103	4·1

SCARLET FEVER, 1891-1900.

Number of attacks, of deaths, and case fatality per cent. at different ages :—

AGES	ATTACKS	DEATHS	CASE FATALITY PER CENT.
Under one year.....	246	53	21·6
1 to 2 years	773	149	19·3
2 to 3 „	1,399	206	14·7
3 to 4 „	1,874	229	12·2
4 to 5 „	2,009	174	8·7
5 to 6 „	1,931	110	5·7
6 to 7 „	1,704	77	4·5
7 to 8 „	1,533	52	3·4
8 to 9 „	1,236	27	2·2
9 to 10 „	1,014	22	2·2
10 to 15 „	2,921	51	1·7
15 to 20 „	921	26	2·8
20 to 25 „	417	12	2·9
25 to 35 „	327	6	1·8
35 to 45 „	85	4	4·7
Over 45 „	32	1	3·1
All ages.....	18,422	1,199	6·5

TABLE 5.

SCARLET FEVER MORTALITY, 1900.—RATE PER 1000 LIVING, COMPARED
WITH MEAN OF FIVE YEARS.

	1895	1896	1897	1898	1899	Mean	1900
England and Wales.....	0·15	0·18	0·15	0·11	0·12	0·14	0·11
33 Great Towns	0·18	0·22	0·18	0·14	0·13	0·17	0·13
London.....	0·19	0·21	0·18	0·13	0·09	0·16	0·08
Manchester City.....	0·33	0·37	0·23	0·12	0·08	0·23	0·19
Manchester Township	0·37	0·41	0·27	0·11	0·08	0·25	0·16
North Manchester	0·24	0·24	0·29	0·12	0·09	0·20	0·24
South Manchester	0·35	0·41	0·17	0·12	0·09	0·23	0·18
67 Smaller Towns	0·16	0·20	0·15	0·10	0·12	0·15	0·12
Rural Districts.....	0·12	0·14	0·12	0·09	0·10	0·11	0·10

If a comparison is instituted between Table 1 and the corresponding table for 1899, it will be seen that the disease does not descend during the first two quarters of the year as it does in 1899, but maintains a uniformly high level, in fact it is manifest that the disease is steadily ascending.

There is, accordingly, nothing like the difference between the number of cases reported in the last half and the number reported in the first half of 1900 that there is in 1899.

Table 2 shows that the attack rate per 1,000 in 1900 is less by 0·20 than the attack rate in twelve towns with which Manchester is compared, and that the incidence is excessive on the Northern Districts of the City. This is very clearly brought out in Table 3, from which it is seen that the districts most affected are Harpurhey, Moston, and Newton Heath, the districts lying nearest to the hospital. That this has not to do with the hospital appears to be indicated by reference to former years, in which these districts do not stand out in the same manner.

After these, the districts most affected are West Gorton, Rusholme, Beswick, and Bradford, distinguished, in the aggregate, by the defective nature of the closet accommodation.

Table 5 shows that, on an average of five years, the death rate from Scarlet Fever is higher than for the 33 large towns.

Table 4 adds fresh figures to those already compiled in regard to fatality at different ages, and shows that the fatality of Scarlet Fever increases up to the age of 10, that at the age of 10 to 15 it is at a minimum, after which it increases, never, however, reaching a high figure at subsequent ages.

An interesting question is whether the attacks in any one district are persistently more fatal than those in another.

Another is whether a high attack rate is coincident with a high fatality.

If we compare Table 3 with the corresponding Table for 1899 we must answer both questions in the negative. In the district of Bradford alone does the fatality continue moderately high for three successive years.

It has been stated that we are now on an ascending wave of Scarlet Fever.

If Table 3 for Scarlet Fever be compared with the corresponding table for previous years it will be seen that the increase has been general, that it was already manifest in 1899, and has become much more marked in 1900. It will also be noted that in 1899 the districts of Moston and Harpurhey show a very high rate of attack, while in 1900 the same districts, along with Newton Heath, exhibit the highest attack rate.

In the Report for 1898 it was shown that one of the factors in determining the highest attack rates was rapid natural increase of the population. But this factor is quite inadequate to account for the distribution of the disease during the last two years.

Amongst the influences determining the spread of the disease which we have hitherto considered has been---

- (1) Propagation in school.
- (2) Propagation through excreta in contaminated soil.
- (3) Direct infection.
- (4) The effect of return cases.

In regard to the schools, precise data have been recorded yearly showing to what extent the disease may be conveyed from scholar to scholar. Reasons have been given for believing that the disease under normal circumstances is not easily spread by this means, in comparison with Measles and Whooping Cough, although with an increasing epidemic the school factor increases. This view is nowise altered by a study of the details of school distribution in 1900. It becomes, however, interesting to note the behaviour of Scarlet Fever in schools in view of its unequal distribution in the Sanitary Divisions of the City.

In regard to the second factor, viz., the influence of contaminated soil, evidence has been steadily accumulated to show that Scarlet Fever stands in closer relation to the nature of the closet accommodation than either Enteric Fever or Summer Diarrhœa. This is, however, not the only reason for connecting Scarlet Fever with fouling of the soil. The curve of Scarlet Fever responds to seasonal changes in precisely the same manner as does that of Diarrhœa or Enteric Fever. Now the changes in the curve of Enteric incidence are probably connected with changes in the soil, as are also those of the curve of deaths from Diarrhœa.

There is no other cause adequate to account for the alterations introduced by a higher temperature and more sunshine, and it follows, therefore, that in all probability Scarlet Fever ascends in the Autumn from the growth of specific infection in the soil. The pathology of Scarlet Fever lends further support to the suggestion.

With regard to return cases of Scarlet Fever—that is to say, infection produced by cases returning in an infective condition from the isolation hospital—I have always regarded this as a matter of serious import. Dr. Millard, of Burton-on-Trent, has recently presented this as explanatory of his view that isolation hospitals for Scarlet Fever have failed to give the protection to the community expected from them. Now, so far as this result of treatment in hospitals goes, I hold that it is entirely preventable by a scheme for the separation of convalescents in isolation wards for at least ten days before their discharge. The details of this scheme have been already given in former reports. Although this scheme has not been recently carried out, I nevertheless adhere to it as a means by which return cases may be prevented. I do not say the

only means, as it may be that by a systematic disinfection of the nostrils and ears it may be possible to stop the occurrence of these cases without special isolation before discharge. At the same time, so far as I can judge, it should be possible without material increase of expenditure to carry out the whole of my proposals. In the Annual Report for 1895 this subject was first opened, and in the Report for 1896 the means by which these cases may be avoided were detailed. The conclusions were arrived at in the following manner:—

First of all, a number of details were ascertained with regard to the discharged cases causing infection at home and the cases infected. From these it appeared that there were practically no cases occurring at home at the intervals existing between the attack in cases removed to the hospital and the subsequent attack after the return of the patient. What, however, is very striking is that for the years 1894 and 1895 there were no subsequent cases at home after the discharge of the patient from quarantine within a period of 14 days in 1894, and only one at an interval of 14 days. In 1895 there were two cases—one day after the release from quarantine of the first patient. In both cases the first patient had been kept isolated for too short a period—viz., 34 and 37 days respectively.

There were, however, four cases when the patient had been kept in isolation 40 days or more, but all of them at an interval between discharge and subsequent attack of over 14 days.

If we accept Dr. Thompson's dictum, that the subsequent case must occur within 14 days to justify a belief that the attack was due to the previous case released, there was only one case in 1894 and two cases in 1895, as against 18 connected with patients discharged from hospital in 1894 and 31 in 1895, in which the period between the first attack and the second exceeded 40 days.

I felt justified in concluding that return Scarlet Fever is a hospital phenomenon. Professor Simpson, in a report made to the Metropolitan Asylums Board as the result of a laborious investigation, reaches the same conclusions both in regard to the nature of the occurrence and the mode of prevention which I placed before you in 1895 and 1896. From the facts which are recorded in my Annual Reports year by year, it has been quite

clear to me for some years that the period during which the first case is retained in hospital after the first six weeks has practically nothing to do with the occurrence of return cases. This was, indeed, evident from the facts given in the Annual Report for 1895.

If, however, return cases are specially connected with hospitals, there can be very little doubt as to how infection occurs. In respect of his capacity to convey infection, a child discharged from hospital is less, not more, likely to convey infection than a child outside, so far as the clothing and skin are concerned. The only point of difference, in fact, is that the child from inside a hospital comes from contact with other and more recent cases, the child released at home usually does not.

If, however, the infection is from these cases and not from the patient himself, then it must be stored up in some part not reached by the bath. Manifestly in the act of breathing such storage will occur in the nasal cavities. This, therefore, is the cause of return cases, and administration must be directed towards the removal of the stored-up infection.

During those periods, when strict procedures were carried out in Monsall Hospital with a view to destroy or remove such infective matter from the nasal cavities, practically no return cases occurred.

A recent view has been put forward that nasal and other discharges are the cause of return cases, and Professor Simpson apparently inclines to this view. Naturally the presence of nasal discharge tends to cause dislodgment of the infection which has been intercepted in the nasal cavities. If, however, it were believed that nasal discharge is responsible itself for return cases, apart from the storage of infectious matter, then we must conclude that the hospital is responsible for the nasal discharge, and it becomes an imperative necessity to cure it and to disinfect the nostrils before discharge.

I am not disposed, however, to conclude that nasal discharge plays any special part in these occurrences.

I do not wish by this statement to undervalue the importance of Rhinitis, Otorrhœa, and other septic conditions in Scarlet Fever. Indeed, over ten years ago, I noted that it sufficed to take patients into a ward not recently used to diminish the incidence of such complications as Rhinitis, Otorrhœa, Cardiac affections, and Nephritis. Further, I have always held that strict antiseptic precautions are as necessary in a Scarlet Fever as in a Surgical Ward. What I doubt, however, is whether these discharges, dangerous as separate communicable diseases, have very much to do with the occurrence of return cases, except in an indirect manner.

The whole subject has been recently raised before the Epidemiological Society in a communication of conspicuous ability by Dr. C. Killick Millard, who gives numerous statistics which appear to show that isolation in hospital has not diminished either the incidence or mortality from Scarlet Fever.

Dr. Millard suggests that this is largely owing to the occurrence of return cases, and observes that it is impossible to define the extent to which discharged cases are infectious, a point which I had already submitted to you.

He is evidently quite unaware of the work which has been done in this matter in Manchester, as he regrets the absence of figures showing prolonged intervals between cases treated at home, one of which has been discharged.

One cannot but agree with him to some extent. He has, however, not stated the reason why isolation in hospital has failed to produce a greater degree of benefit.

An analysis of the occurrence of cases of Scarlet Fever after removal to hospital shows that subsequent cases occur in almost the same proportion as if cases are not removed.

Thus, *so far as infection at home is concerned*, the benefit derived from isolation in hospital is not all that could be desired.

A second reason is that *cases continue to occur at home* in a certain proportion of cases more than 10 days after removal of the first case to hospital, indicating either that the disinfection has omitted some essential article or place, or that slight intermediate infection has occurred and escaped attention. Moreover, there is a continuous *infection from slight overlooked cases*. On the other hand, were the cases not removed to hospital we should have a considerable number of infections owing to inefficient isolation or to premature return to school, which we now escape.

It is this saving which we must balance against the so-called "return" cases.

This subject is so complicated, as raised by Dr. Millard, that I prefer to defer it till I have time to fully consider the details and to analyse the mass of materials which we possess before discussing it further. I am inclined to agree with those who decline to base an opinion entirely on comparative statistics from different localities. There exist facts which, properly used, should throw considerable light on the operations of the fever hospital from within, though much labour will, no doubt, be required to obtain and compile them.

With this preface, I now give the return cases for the year 1900. See following tables.

RETURN CASES.

Prog. No. of second case	Date of Eruption of second case	Prog. No. of first case	Date of Notification of first case	Date of Eruption of first case	Date of removal to Hospital	Date of return home	Interval between return home and eruption in second case	No. of days in Hospital, first case	Contracted at		Other possible sources	Complications of first case during stay in Hospital	Condition of first case when discharged as stated by relatives
									Home	Another House			
9 } 10 }	Jan. 1 Jan. 2	890	Oct. 11	Oct. 10	Oct. 11	Dec. 29	4 days	79	+			Rhinitis	
22	Jan. 3	...	...	...	...	...	5 "	...	+			Acute Tonsillitis, Varicocele	
85	Jan. 11	1049	Nov. 4	Nov. 3	Nov. 4	Dec. 19	15 "	45	+			Albuminuria	
117 } 118 }	Jan. 16 Jan. 16	911 1140	Oct. 14 Nov. 18	Oct. 13 Nov. 4	Oct. 14 Nov. 18	Dec. 19 Jan. 9	23 " 7 "	66 61	+				
161	Jan. 24	...	...	...	...	...	...	...	+
178	Jan. 21	1090	Nov. 11	Nov. 9	Nov. 11	Jan. 19	5 "	69	+			Hæm. Nephritis	
193	Jan. 28	671	Sept. 7	Sept. 5	Sept. 7	Dec. 22	30 "	106	+			Diphtheria	
222	Jan. 28	1165	Nov. 22	Nov. 21	Nov. 23	Jan. 23	5 "	61	+			Rhinitis	
242	Feb. 1	1203	Nov. 25	Nov. 25	Nov. 25	Jan. 23	9 "	59	+			Rhinitis	
268	Feb. 1	1275	Dec. 3	Dec. 3	Dec. 3	Jan. 19	13 "	47	+				
277	Feb. 7	Admitted	from Washington	Nov. 9	Oct. 19	Feb. 2	5 "	107		+	3 cases removed in 1899		
283	Jan. 24	1076	Nov. 10	Nov. 9	Nov. 11	Jan. 5	19 "	55	+		Several cases from same street		Discharge from ear
	Feb. 10	1105	Nov. 14	Nov. 13	Nov. 14	Jan. 19	22 "	65		+			
299	Feb. 13	1242	Nov. 29	Nov. 29	Nov. 30	Feb. 2	11 "	64	+				
382	Feb. 27	1319	Dec. 6	Dec. 4	Dec. 6	Feb. 20	7 "	76		+		Adenitis (double)	
539	Mar. 23	1433	Dec. 23	Dec. 20	Dec. 23	Mar. 16	7 "	83		+	School possibly infected	Otitis (L.), Rhinitis	
567	Mar. 25	1258	Nov. 30	Nov. 28	Nov. 30	Mar. 13	12 "	103	+			Rhinitis, Otitis, slight Adenitis	
570	Mar. 25	1148	Nov. 20	Nov. 16	Nov. 20	Mar. 9	16 "	109	+				Sore nose
575	Mar. 26	156	Jan. 24	Jan. 15	Jan. 24	Mar. 16	10 "	51	+				
592	Apl. 1	1287	Dec. 4	Dec. 3	Dec. 4	Feb. 16	47 "	74	+				
593	Mar. 30	1008	Oct. 28	Oct. 25	Oct. 28	Feb. 27	31 "	158	+			Otitis (R.), Rhinitis, Sup. Adenitis	
668	Apl. 11	243	Feb. 5	Feb. 3	Feb. 6	Apl. 3	8 "	56	+			Adenitis, Otitis (2, Rhinitis	Discharge from nose
671	Apl. 14	202	Jan. 27	Jan. 26	Jan. 28	Apl. 6	8 "	68	+			Nephritis	
764	Apl. 27	131	Jan. 19	Jan. 18	Jan. 19	Apl. 17	10 "	88	+			Rhinitis	Discharge from nose
765	Apl. 28	174	Jan. 26	Jan. 25	Jan. 26	Apl. 17	11 "	82	+			Rhinitis, Otitis	
901	May 26	254	Feb. 7	Feb. 1	Feb. 6	Apl. 24	32 "	77	+			Rhinitis	
1034	June 18	702	Apl. 18	Apl. 16	Apl. 18	June 12	6 "	55	+			Nil	
1090 } 1091 }	June 28 June 29	728	Apl. 22	Apl. 22	Apl. 22	June 19	9 "	58	+			Adenitis	
1152	July 5	...	...	...	...	...	10 "	...	+				
1308	July 30	772	Apl. 30	Apl. 29	Apl. 30	June 29	6 "	60	+			Rhinitis	
1532	Sept. 3	919	May 30	May 28	May 30	July 24	6 "	55	+			Otitis (L.)	
		954	June 4	June 1	June 5	Aug. 17	17 "	73	+			Otitis (L.)	Discharge from ear and sore nose

Prog. No. of second case	Date of Eruption of second case	Prog. No. of first case	Date of Notification of first case	Date of Eruption of first case	Date of removal to Hospital	Date of return home	Interval between return home and eruption in second case	No. of days in Hospital, first case	Contracted at		Other possible sources	Complications of first case during stay in Hospital	Condition of first case when discharged as stated by relatives
									Home	Another House			
1560	Sept. 6	1086	June 27	June 25	June 27	Aug. 21	16 days	55	+	+		Albuminuria, Rhinitis	Discharge from ears
1614	Sept. 11	892	May 26	May 25	May 26	July 17	56 "	52	+			Adenitis	
1733	Sept. 26	1017	June 15	June 13	June 15	Aug. 14	43 "	60	+	+		Adenitis	
1735	Sept. 13	1017	June 15	June 13	June 15	Aug. 14	30 "	60		+			
1765	Sept. 23	1283	July 27	July 26	July 27	Sept. 21	2 "	56	+		Overlooked case in vicinity	Adenitis	
1779	Oct. 2	1146	July 5	July 3	July 5	Sept. 14	18 "	71					
1780	Oct. 2	...	...	...	...	...	...	...
1788	Oct. 2	1256	July 23	July 21	July 23	Sept. 18	14 "	57	+	+		Rhinitis, Otitis, Synovitis	Said to be desquamating
1822	Oct. 6	1289	July 28	July 28	July 28	Sept. 21	15 "	55	+	+		Varicella (2nd day)	
1840	Oct. 8	1320	Aug. 2	Aug. 1	Aug. 2	Sept. 25	13 "	54	+	+			
1873	Oct. 13	1175	July 10	July 8	July 10	Oct. 5	8 "	87	+	+		Rhinitis	
1887	Oct. 15	1201	July 16	July 14	July 16	Oct. 5	10 "	81	+	+			
1933	Oct. 14	1191	July 13	July 12	July 13	Oct. 5	9 "	84		+		Rhinitis	
1939	Oct. 20	1296	July 30	July 29	July 30	Sept. 25	25 "	56	+				
1963	Oct. 20	1413	Aug. 15	Aug. 13	Aug. 15	Oct. 16	4 "	62		+			
1972	Oct. 21	1479	Aug. 29	Aug. 21	Aug. 29	Oct. 16	5 "	48		+		Rhinitis, Otitis (2)	
2009	Oct. 28	1522	Sept. 3	Sept. 3	Sept. 3	Oct. 23	5 "	50	+	+		Rhinitis, Otitis (2) Adenitis	
2033	Oct. 29	1522	Sept. 3	Sept. 3	Sept. 3	Oct. 23	6 "	50				sup. Rhinitis	
2076	Nov. 1	1462	Aug. 26	Aug. 26	Aug. 26	Oct. 26	6 "	61		+			
2168	Nov. 13	1575	Sept. 10	Sept. 7	Sept. 10	Oct. 23	21 "	43	+			Otitis (R.)	Loose skin on feet and fingers
2189	Nov. 16	1452	Aug. 23	Aug. 22	Aug. 24	Oct. 23	24 "	60	+	+			
2196	Nov. 16	1665	Sept. 19	Sept. 17	Sept. 19	Nov. 2	14 "	44	+	+			
2284	Nov. 27	1641	Sept. 17	Aug. 27	Sept. 17	Nov. 20	7 "	64	+	+			
2336	Nov. 30	1541	Sept. 5	Sept. 4	Sept. 5	Nov. 23	7 "	79	+	+		Hæmorr. Nephritis, Rhinitis	
2351	Dec. 5	1783	Oct. 3	Oct. 3	Oct. 3	Nov. 30	5 "	57	+	+			
2353	Dec. 5	1591	Oct. 11	Oct. 10	Oct. 11	Nov. 6	29 "	26	+	+		Rhinitis, Otitis (L.)	
2360	Dec. 5	1785	Oct. 3	Oct. 2	Oct. 3	Nov. 27	8 "	55	+	+		Nephritis, Adenitis	
2368	Dec. 7	1801	Oct. 5	Oct. 3	Oct. 5	Nov. 30	7 "	56	+	+			
2396	Dec. 10	1923	Oct. 19	Oct. 17	Oct. 20	Dec. 4	6 "	45	+	+		Adenitis, Rhinitis	
2401	Dec. 11	1692	Sept. 22	Sept. 21	Sept. 22	Nov. 27	14 "	66	+	+			Discharge from nose
2499	Dec. 24	1895	Oct. 17	Oct. 14	Oct. 17	Dec. 11	13 "	55	+	+		Rhinitis, Otitis (2)	
2517	Dec. 24	1704	Sept. 24	Sept. 22	Sept. 24	Nov. 13	41 "	50	+	+			

These may be classified as follows :—

(1) Return cases occurring *at home* 14 days or less after the discharge of the first case, 40. Of these, exception may be taken to 3 cases. In one (178) there were two eruptions in the second case, of which one would make the interval 10 days, and the other 30. In another case the interval between discharge and the return attack was only 1 day. But there were two cases discharged, and we may, I think, accept this. In case 410, two cases had been nursed at home whose attacks began on December 14th and December 17th. These also we may dismiss as not germane.

(2) Return cases occurring at home from 15 to and including 21 days after discharge, 9 cases.

(3) Return cases at home up to 40 days, 7 cases.

(4) Return cases at home exceeding 40 days, 5 cases.

Assuming that my view of the causation of return cases is correct, and Professor Simpson practically adopts it, the limit of 14 days between discharge of the first case from hospital and the subsequent eruption can scarcely be accepted, and, indeed, it is impossible to fix any definite limit.

The above figures, it may be observed, contain within themselves the strongest evidence that the cases occurring after discharge are really due to the cases discharged, and not to accidental infections. Otherwise there is no reason for any special excess of the numbers occurring within 14 days of discharge.

That the period after discharge at which a second case may be properly assigned to the case discharged may be over a fortnight appears to be shown by 2168. The discharged case in this instance was sent out on October 23rd, but did not return home till November 3rd. After November 6th the first and subsequent case slept together, the eruption in the subsequent case appearing on November 13th.

(5) The number of cases which might have derived infection from discharged cases outside the home is 10. Of these, two are rejected, the interval being only 1 day, and one as the interval was 16 days. We thus get 7 cases.

Adding the cases included under 1, 2, and 5, we get a total of 56 cases.

HOME INFECTIONS.

Further light may be obtained on this subject by a study of clearly-traced infections, nearly all at home.

Of other sources of infection, 526 are put down to schools. Of these, 313 probably contracted the disease at school, and in 155 of the cases it is

possible whilst 58 are intermediate in the probability of infection. There were 22 cases traced directly to visiting infected houses, and 44 from playing with children from infected houses. Three cases may have been caused through the mother of the patients visiting Monsall Hospital. There were 13 cases notified in which a history of sore throat in another person preceded the notified case, and in 10 cases a history of Influenza. There were four houses in which there were doubtful cases not notified, and four in which there was Quinsy in addition to the Scarlet Fever patient.

The following table shows the relations of cases infected, apparently, at home :—

First case nursed at home altogether, or only up to the removal of subsequent cases. Subsequent Cases.	Cases in which the eruption appeared within 10 days of removal of a previous case to Hospital.	Cases in which the interval after removal of the first case exceeded 10 days.	Cases arising from previous overlooked cases at home.	TOTAL
192 Most of these cases occurred shortly after the onset of the first case. The longest intervals were— 3 months 62 days 60 „ 39 „ 31 „ 28 „ 22 „	152	35 In a number of these cases the interval considerably exceeded 10 days, viz. :— 71, 44, 42, 38, 36, 32, 32, 29, 28, 27, 26, 24, 23, 22, 22, 20, 20, and 19 days respectively.	82	461

It thus appears that the number of cases in which the interval between the first and second case treated at home exceeded six weeks was only three, nor is there any process of continuous infection going on from cases kept at home which can account for the difference between this and the number of “return” cases at long intervals after the first case.

In column 3, again, the number of cases occurring at undue intervals after the removal of the first case is somewhat considerable. Some of them, no doubt, are due not to retained infection, but to fresh infection, or to overlooked cases occurring shortly after the removal of the first case. In only one instance do we find an interval comparable with the interval occurring in “return” cases.

Propagation of Scarlet Fever by contaminated soil.

Statistics have been given year by year showing the relation of Scarlet Fever to water-closets, pails, and middens. Special importance has been attached to pail-closets in connection with this disease. The idea has been to see whether any relation existed between the number of cases and the position and class of closet.

Importance has been attached to the position of the pail-closet for these reasons. If the pail-closet adjoins the house, the infection when present is nearer to the kitchen. The mere fact that the closet adjoins the house usually indicates a narrow space in the rear of the dwelling, and the effect is that what infection exists is concentrated. Further, the urine guides are more liable to be neglected, as are also leaky pails, in such houses than in better-class houses. For all these reasons, infection, if it occurs from the contamination of the soil in connection with pails, is more liable to occur in connection with pails which adjoin than with pails which are some way off the house.

In working out these figures I have omitted all cases traced to other cases in the same house, since to include these would be merely to repeat and emphasise the statistics of untraced cases.

UNTRACED CASES.

PAIL-CLOSET			MIDDEN				
Adjoins	Within 4 feet	4 feet and over	Adjoins	Within 6 feet	6 feet and over	Water- closet	Waste Water- closet
357	22	294	41	44	125	279	13
673			210			292 + 21	
1196							

Of these, in 21 instances there are both water-closets and pails or middens

This number must be added to 292 for purposes of comparison

DEFECTIVE.

45	1	33	11	...	3	6	...	Total 99
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PAIL OR MIDDEN WITH W.C.

4	1	14	...	1	1	Total 21
---	---	----	-----	---	---	-----	-----	----------

DOUBTFULLY-TRACED CASES.

PAIL-CLOSET			MIDDEN				
Adjoins	Under 4 feet	4 feet and over	Adjoins	Under 6 feet	6 feet and over	Water-closet	Waste Water-closet
127	18	172	16	28	72	148	4
317			116			152 + 4	
589							

With Water-closet---
Pails 2, Middens 2.

DEFECTIVE CLOSETS.

12	4	13	3	...	5	2	...	Total 39
----	---	----	---	-----	---	---	-----	----------

TRACED CASES OUTSIDE THE HOME, INCLUDING INSTITUTION CASES,
OTHER THAN THOSE OCCURRING AT MONSALL.

PAIL-CLOSET			MIDDEN				
Adjoins	Under 4 feet	4 feet and over	Adjoins	Under 6 feet	6 feet and over	Water-closet	Waste Water-closet
13	0	14	3	4	9	40	2
27			16			42	
85							

Defective—1 Pail-closet.

THERE WHERE WITHIN THE CITY IN 1900—

PAIL-CLOSETS	MIDDEN PRIVIES	WATER-CLOSETS
75,740	22,680	39,321

The question as to the connection between the fouling of the ground by excreta and the autumnal increase of Scarlet Fever is an important one, and if it were possible to attain absolute proof in this manner, no trouble taken in collecting statistics could be too great. But probability, not proof, is the utmost that can be got in this way.

If fouling of the ground plays a part in the extension of the disease, we should expect to find that the proportion of pail-closets adjoining houses was unduly high in the untraced cases as compared with those cases whose source of infection was presumably not at home.

That is precisely what we see in the statistics given above. Nor is this preponderance confined to one year, as will be seen from the following table:—

POSITION OF PAIL IN UNTRACED CASES.

	1896	1897	1898	1899	1900	Total
Pail adjoins	665	457	210	314	357	1903
Pail under 4 feet away	64	56	23	26	22	191
Pail 4 feet and over from house	418	408	150	254	294	1524

POSITION OF PAIL IN DOUBTFULLY-TRACED CASES

(that is, to cases the source of infection of which has been assigned with some degree of probability outside the home).

	1896	1897	1898	1899	1900	Total
Pail adjoins	122	100	27	30	127	406
Pail under 4 feet away	20	16	1	1	18	56
Pail 4 feet and over from house	73	91	34	39	172	429

The term doubtfully-traced cases does not relate throughout to the same cases. In 1900 it is made to include cases probably infected at school for the most part, and it does not include cases doubtfully traced at home. These cases, however, are included in 1896 and 1897. Hence their difference from subsequent years.

In the aggregate of five years, we see that amongst untraced cases there is a marked preponderance of pails adjoining houses; whilst among the doubtfully-traced cases, mostly relating to cases outside the home, the relation is reversed.

The relation between the proximity of pail-closets to houses and the number of untraced cases is more intimate than is the same relation for Enteric Fever and Summer Diarrhœa, and I am disposed to consider that the facts which have been given go some way to establish a connection between Scarlet Fever and contamination of the soil.

The last question to be considered is the occurrence of Scarlet Fever in schools.

In order to ascertain what part the school plays in propagating the disease, the following criterion is laid down. No connection shall be assumed to exist between cases occurring in a school and the school unless the cases are for each department separated by an interval not exceeding two months. In order still further to exclude extraneous influence, cases traced to a source outside the school are altogether excluded, and only those cases are included which are untraced outside the school.

A school record is kept, of which extracts were given in preceding Annual Reports. The schools were so much more involved in 1900 than in previous years that it would swell the report to an undue size if every record were given. I therefore give only one or two, by way of illustrating the evidence on which the following summary of propagation in schools is based :—

BURGESS STREET BOARD SCHOOL, HARPURHEY.

Nos. on School Register, 107, 149, 205, and 215 :—

Date of Eruption	Age	Sex	Department	Date of Eruption	Age	Sex	Department
Jan. 8.....	8	f.	Girls N. T.	Sept. 28...	4	m.	Infants N. T.
Jan. 8.....	7	f.	Infants N. T.	Oct. 7... 11	m.	Boys N. T.	
Jan. 22.....	6	m.	Infants T. (sister)	Oct. 16... 8	f.	Girls N. T.	
March 12...	4	m.	Infants N. T.	Oct. 21... 4	f.	Infants N. T.	
March 16...	6	f.	Infants N. T.	Nov. 1... 14	f.	Girls N. T.	
March 20...	8	m.	Boys N. T.	Nov. 1... 4	m.	Infants N. T.	
March 21...	6	m.	Infants T. (brother)	Nov. 2... 4	m.	Infants N. T.	
March 29...	7	m.	Boys N. T.	Nov. 3... 10	m.	Boys N. T.	
April 4... 5	m.	Infants N. T.		Nov. 4... 7	f.	Girls N. T.	
April 6... 5	f.	Infants N. T.		Nov. 8... 5	m.	Infants N. T.	
April 6... 4	m.	Infants N. T.		Nov. 14... 10	f.	Girls T. (brother)	
April 7... 5	m.	Infants N. T.		Nov. 14... 7	f.	Girls T. (brother)	
April 7... 10	f.	Girls N. T.		Nov. 14... 6	f.	Infants T. (brother)	
April 21... 6	m.	Infants T. (sister)		Nov. 14... 5	f.	Infants N. T.	
April 22... 7	f.	Infants N. T.		Nov. 16... 3	f.	Infants T. (sister)	
April 24... 4	f.	Infants T. (sister)		Nov. 16... 5	f.	Infants T. (sister)	
May 5... 6	f.	Infants N. T.		Nov. 16... 6	m.	Infants N. T.	
May 8... 5	m.	Infants N. T.		Nov. 21... 4	m.	Infants N. T.	
May 17... 7	m.	Boys N. T.		Nov. 21... 4	f.	Infants N. T.	
June 1... 8	f.	Girls N. T.		Nov. 21... 5	f.	Infants N. T.	
June 8... 8	m.	Boys N. T.		Nov. 27... 9	m.	Boys T. (sister)	
June 19... 3	f.	Infants N. T.		Nov. 27... 5	f.	Infants N. T.	
July 17... 6	f.	Infants N. T.		Nov. 28... 4	f.	Infants N. T.	
July 31... 4	m.	Infants T. (brother)		Nov. 29... 6	f.	Infants T. (brother)	
Aug. 4... 6	f.	Infants N. T.		Nov. 30... 3	f.	Infants T. (brother)	
Aug. 7... 8	f.	Girls T. (brother)		Dec. 1... 5	f.	Infants N. T.	
Aug. 9... 5	f.	Infants T.		Dec. 2... 9	f.	Girls N. T.	
Aug. 11... 8	f.	Girls N. T.		Dec. 3... 12	f.	Girls N. T.	
Aug. 20... 6	m.	Infants T. (sister)		Dec. 3... 5	f.	Infants N. T.	
Sept. 6... 7	f.	Infants N. T.		Dec. 6... 11	m.	Boys N. T.	
Sept. 18... 12	f.	Girls N. T.		Dec. 8... 6	m.	Infants N. T.	
Sept. 21... 10	f.	Girls T. (sister)					

T=Traced to a source outside the School.

N T=Not traced to such a source.

THOMAS STREET BOARD SCHOOL.

Nos. on School Register, 113 and 157 :—

Date of Eruption	Age	Sex	Department	Date of Eruption	Age	Sex	Department
Jan. 7.....	4	m.	Infants N. T.	Aug. 2 ...	10	f.	Girls N. T.
Feb. 7.....	4	f.	Infants N. T.	Aug. 13 ...	11	m.	Boys N. T.
Feb. 10 ...	6	m.	Infants N. T.	Aug. 20 ...	5	m.	Infants N. T.
Apr. 1 ...	7	m.	Boys N. T.	Sept. 4 ...	4	f.	Infants N. T.
Apr. 15 ...	5	f.	Infants N. T.	Sept. 21 ...	8	m.	Boys N. T.
Apr. 24 ...	9	f.	Girls N. T.	Sept. 25 ...	5	f.	Infants N. T.
May 22 ...	7	f.	Girls N. T.	Sept. 27 ...	6	m.	Infants N. T.
May 25 ...	4	f.	Infants T. (sister)	Sept. 30 ...	6	m.	Infants T. (sister)
May 25 ...	5	m.	Infants T. (sister)	Oct. 5 ...	10	f.	Girls T.
May 28 ...	9	f.	Girls N. T.	Oct. 5 ...	5	f.	Infants N. T.
June 6... ..	5	f.	Infants T.	Oct. 6 ...	10	f.	Girls N. T.
June 17 ...	10	m.	Boys N. T.	Oct. 29 ...	8	m.	Boys N. T.
June 19 ...	6	m.	Infants T. (brother)	Dec. 11 ...	7	m.	Boys N. T.
June 24 ...	8	f.	Girls T. (brother)	Dec. 14 ...	8	m.	Boys N. T.

CULCHETH BRITISH SCHOOL, NEWTON HEATH.*

Nos. on School Register 59 :—

Date of Eruption	Age	Sex	Department	Date of Eruption	Age	Sex	Department
Jan. 1	10	m.	Mixed N. T.	Oct. 12 ...	11	f.	Mixed N. T.
Jan. 5	9	f.	Mixed N. T.	Oct. 13 ...	8	f.	Mixed T. (sister)
Feb. 11 ...	7	m.	Mixed N. T.	Oct. 15 ...	9	m.	Mixed N. T.
June 16 ...	5	f.	Infants N.T.	Oct. 16 ...	12	f.	Mixed N. T.
Aug. 15 ...	4	f.	Infants N.T.	Oct. 17 ...	10	f.	Mixed N. T.
Aug. 17 ...	7	f.	Mixed N. T.	Oct. 20 ...	8	m.	Mixed N. T.
Sep. 29 ...	9	m.	Mixed N. T.	Oct. 24 ...	5	f.	Infant N. T.
Sep. 30 ...	9	m.	Mixed N. T.	Oct. 27 ...	12	m.	Mixed N. T.
Sep. 30 ...	8	f.	Mixed N. T.	Oct. 29 ...	6	f.	Mixed N. T.

EMBDEN STREET BOARD SCHOOL, HULME.

Nos. on School Register, 115 :—

Date of Eruption	Age	Sex	Department	Date of Eruption	Age	Sex	Department
June 4	5	f.	Infants N. T.	June 22 ...	5	f.	Infants N. T.
June 9	5	f.	Infants N. T.	June 25 ...	5	m.	Infants N. T.

ST. MATTHEW'S BOARD SCHOOL.

Nos. on School Register, 91 and 201 :—

Date of Eruption	Age	Sex	Department	Date of Eruption	Age	Sex	Department
Jan. 7	11	f.	Mixed N. T.	Aug. 10 ...	10	m.	Mixed T. (brother)
Jan. 8	8	m.	Mixed N. T.	Sep. 11.....	10	f.	Mixed N. T.
Jan. 11.....	10	m.	Mixed N. T.	Sep. 22.....	12	f.	Mixed N. T.
Feb. 1	10	m.	Mixed N. T.	Oct. 19.....	12	f.	Mixed N. T.
March 20...	14	m.	Mixed N. T.	Oct. 28.....	14	f.	Mixed N. T.
March 23...	9	f.	Mixed N. T.	Nov. 17 ...	12	f.	Mixed N. T.
April 8.....	9	m.	Mixed N. T.	Nov. 27 ...	8	m.	Mixed N. T.
April 30 ...	10	f.	Mixed N. T.	Nov. 28 ...	9	f.	Mixed N. T.
June 13 ...	11	m.	Mixed N. T.	Dec. 4	10	f.	Mixed N. T.

HOLY TRINITY (CHURCH OF ENGLAND), RUSHOLME.

Nos. on School Register, 35 and 147 :—

Date of Eruption	Age	Sex	Department	Date of Eruption	Age	Sex	Department
Jan. 14.....	8	f.	Mixed N. T.	Jan. 26.....	6	m.	Infants N. T.
Jan. 15.....	10	m.	Mixed N. T.	Jan. 27.....	9	f.	Mixed N. T.
Jan. 15.....	8	f.	Mixed N. T.	Jan. 27.....	10	m.	Mixed N. T.
Jan. 15.....	12	m.	Mixed N. T.	Jan. 28.....	9	f.	Mixed N. T.
Jan. 16.....	10	m.	Mixed N. T.	Jan. 29.....	10	m.	Mixed N. T.
Jan. 16.....	8	f.	Mixed N. T.	March 9 ...	8	f.	Mixed N. T.
Jan. 17.....	6	f.	Infants N. T.	March 15...	6	m.	Infants T. (brother)
Jan. 18.....	13	f.	Mixed N. T.	April 14 ...	8	m.	Mixed T. (brother)
Jan. 21.....	4	f.	Infants N. T.	June 6	9	f.	Mixed N. T.
Jan. 22.....	8	f.	Mixed N. T.	Oct. 23.....	3	f.	Infants N. T.
Jan. 25.....	5	f.	Infants N. T.	Nov. 15 ...	5	f.	Infants N. T.
Jan. 25.....	9	f.	Mixed N. T.	Nov. 18 ...	4	m.	Infants N. T.

CHRIST CHURCH (CHURCH OF ENGLAND), HARPURHEY.

Nos. on School Register, 99, 155, and 213 :—

Date of Eruption	Age	Sex	Department	Date of Eruption	Age	Sex	Department
Feb. 2 ...	8	f.	Mixed N. T.	Aug. 10 ...	10	f.	Mixed T. (brother)
Feb. 9 ...	12	f.	Mixed N. T.	Aug. 28 ...	7	f.	Mixed N. T.
Feb. 9 ...	4	f.	Infants N. T.	Aug. 29 ...	5	m.	Infants T. (brother)
Feb. 17 ...	5	m.	Infants N. T.	Sep. 8 ...	11	f.	Mixed N. T.
Feb. 18 ...	9	f.	Mixed T. (sister)	Sep. 9 ...	11	m.	Mixed N. T.
Feb. 24 ...	8	m.	Mixed T. (brother)	Sep. 9 ...	4	f.	Infants N. T.
Feb. 24 ...	6	f.	Infants N. T.	Sep. 29 ...	7	m.	Mixed N. T.
Mar. 6 ...	12	m.	Mixed T. (brother)	Oct. 3 ...	7	m.	Mixed N. T.
Mar. 14 ...	6	f.	Infants N. T.	Oct. 7 ...	8	m.	Mixed N. T.
Mar. 19 ...	5	f.	Infants N. T.	Oct. 8 ...	8	f.	Mixed N. T.
Mar. 25 ...	10	m.	Mixed N. T.	Oct. 9 ...	8	m.	Mixed N. T.
April 3 ...	6	m.	Infants N. T.	Oct. 11 ...	12	m.	Mixed N. T.
April 7 ...	6	f.	Infants T. (brother)	Oct. 14 ...	11	m.	Mixed N. T.
April 12 ...	3	m.	Infants N. T.	Oct. 22 ...	9	m.	Mixed N. T.
April 14 ...	6	m.	Infants T. (brother)	Oct. 29 ...	7	f.	Mixed N. T.
April 16 ...	9	f.	Mixed T. (brother)	Nov. 15 ...	3	f.	Infants N. T.
April 19 ...	8	m.	Mixed N. T.	Dec. 1 ...	7	m.	Mixed N. T.
April 22 ...	10	m.	Mixed N. T.	Dec. 3 ...	6	f.	Infants N. T.
April 24 ...	10	f.	Mixed T. (brother)	Dec. 10 ...	6	m.	Infants N. T.
May 24 ...	7	m.	Infants N. T.	Dec. 14 ...	11	f.	Mixed N. T.
July 13 ...	5	m.	Infants N. T.	Dec. 16 ...	5	f.	Infants N. T.
July 17 ...	5	f.	Infants N. T.	Dec. 20 ...	6	m.	Infants N. T.
July 17 ...	7	m.	Mixed N. T.	Dec. 20 ...	6	m.	Infants N. T.
Aug. 1 ...	5	m.	Infants N. T.	Dec. 24 ...	8	f.	Mixed N. T.
Aug. 9 ...	7	m.	Mixed T. (brother)				

The following is a Summary, in which the numbers relate to cases apparently connected only through the Schools, of the conclusions drawn from the Records :---

SUMMARY

School Invaded	District	Department	Period of the Year	Invasion of School			
				Slight	Moderate	Severe	No. of Cases
St. Mark's Church of England.....	West Gorton ...	Mixed.....	March, April, May, June (8)			+	8
St. Clement's Church of England..	Openshaw	Girls ...	September to December ...	+			3
Birley Street Board School	Beswick	Infants	March, April, May	+			4
		Girls	October and November.....			+	7
		Boys	May (5), again October, November, December (5)			+	10
St. Philip's Church of England.....	Hulme	Infants ..	March and April.....	+			3
Jews School, Derby Street	Cheetham	Girls	January(3).again in October (2)		+		5
St. John's Church of England	Cheetham	Infants	March, April	+			3
Christ Church	Beswick	Infants	Mar.,April, May, June, July (7)			+	7
Holy Trinity Church of England...	Rusholme	Mixed.....	January (11).....			+	11
		Infants	January (4), and again October, November (3)		+		7
Smedley Road Board School.....	Cheetham	Boys	June and July (4), and again in Sept., Oct., and Nov. (5)		+		9
Ducie Avenue Board School.....	C.-on-M.....	Infants	August, Sept., and Oct. (3)....	+			3
		Boys	March, April, June.....		+		4
St. Patrick's, Livesey Street.....	St. George's ...	Infants	November and Deecember.....	+			3
Grange Street Board School.....	Bradford	Infants	March, April, May, and June.		+		6
Corpus Christi Roman Catholic ...	Miles Platting, Newton Hth.	Infants	July (3), and September, October, and November (7)			+	10
Wesleyan School.....	Longsight	Infants	March (3), October and November (4)		+		7
St. Stephen's Church of England ...	C -on-M.....	Infants	October	+			3

} Aggregate effect severe

SUMMARY—continued

School Invaded	District	Department	Period of the Year	Invasion of School			
				Slight	Moderate	Severe	No. of Cases
St. Philip's, Ridgway Street.....	Ancoats	Boys	October and November.....	+			3
Clarendon Road Board School.....	Crumpsall	Boys	July (3).....	+			6
Chester Street Board School	Ardwick	Infants	September and October (3) ...				9
Christ Church of England.....	Harpurhey	Infants	January (5), May (2), October and November (2)	+			16
Do. do.	Do.	Mixed	February, March, April, May, July (10), and November and December (6)			+	15
St. Ann's Roman Catholic	Ancoats	Infants	February, March, April (4), September, October, November, December (11)		+		8
Mulberry Street Board School.....	Hulme	Girls	March (3) September, October, November (5)	+			3
St. Barnabas' Board School.....	Ancoats	Boys	October, November, December (3)				} 7
Memorial School	Bradford	Infants	February, March, April, May (4)	+			
Higher Grade Board School, Devonshire Street	Ardwick	Mixed	September and October (3) ...	+			4
St. Barnabas' Church of England..	Openshaw	All mixed ..	October and November.....		+		3
St. John's Church of England	Cheetham	Infants	January, February, March ...	+			17
Johnson Street Board School	Bradford	Infants	January to June (9); September to December (8)			+	} 8
Albert Memorial Church of England	St. George's ...	Mixed	September, October, November (5)	+			
		Boys	June, July (3)	+			} 6
		Girls	November, December (3) ...	+			
			March, April (3).....	+			5
			August, September, October ..	+			} 7
			November, December (3)	+			
			November, December (2)	+			
			November (2)	+			Aggregate effect mode- rate

SUMMARY—continued.

School Invaded	District	Department	Period of the Year	Invasion of School			Aggregate effect mode- rate
				Slight	Mod- erate	Severe	
St. Edmund's Roman Catholic, Monsall	St. George's ...	Infants	September (2)	+			} 6
		Boys	October (2)	+			
		Girls	October (2)	+			
Armitage Street Board School.....	Ardwick ..	Infants	October, December		+		5
Thomas Street Board School.....	West Gorton....	Infants	January, February (3)		+		} 8
			April, May (2); August, Sep- tember, October (3)		+		
			April, May (3)		+		
Embden Street Board School	C.-on-M.....	Girls	June (4)	+			3
		Infants .....	.....		+		4
St. Matthew's Board School.....	Ardwick	Junior	July (4), September (2).....		+		6
		(Mixed)			+		+
Bank Meadow Board School	Ardwick	Infants			+		Only 7 cases during the year
Burgess Street Board School	Harpurhey	Infants	March, April, May, June, July (10), September, October, November, December (15)			+	} 25
		Boys	March, May, June (5), Octo- ber, November, December (3)			very severe	
		Girls	April and June (3), Septem- ber, October, November, December (6)			+	
Nelson Street Board School, Miles Platting	Newton	Mixed	January, February, March (3), October, November, Decem- ber (5)		+		9
			Escaped				} 3
			November, December (3)	+			
			September, October (7).....				
St. John's Church of England	Longsight	Infants	December (2)			+	} 9
		Infants	June, July (7), September (2)	+		+	
			August (3)	+			
Upper Jackson Street Board School	Hulme	Boys					} 9
		Girls					
		Mixed					
Ten Acres Lane Board School.....	Newton	Infants					3

The untraced cases in the
boys came all togetherTotal number of untraced
cases on which the
evidence of spread is
based = 42Total number in School
= 63

School Invaded	District	Department	Period of the Year	Invasion of School			
				Slight	Moderate	Severe	No. of Cases
Holy Family Roman Catholic	C.-on-M.....	Boys	January (2)	+			4
St. Wilfrid's Church of England...	Newton	Girls	September (2)	+			4
		Mixed	September, October (4)		+		0
		Infants	October (3)	+			3
Abbott Street Board School, Rochdale Road	St. George's....	Boys	January, February, March ...				3
		Infants	September, October, November (7)			+	7
British School, Dob Lane	Failsworth	Mixed.....	October, November, December (4)		+		4
British School, Gill Street	Blackley	Infants	January, February (3), September, October (10)			+	13
Culcheth British School.....	Newton	Mixed.....	October, November, December (3)	+			3
		Infants	January, February (3), May, June (7), September, October, November (4)			+	14
Dean Lane Board School	Moston	Infants	October				
		Mixed.....	November, December (3)	+			3
Elm Street Wesleyan.....	Ancoats	Infants	April, May (3)	+			8
Every Street Board School	Ancoats	Infants	August, September, October, November (5)	+			8
		Girls	October, November (5)		+		8
Holy Name Roman Catholic	C.-on-M.....	Infants	September, October, November (3)				3
		Boys	October				
		Girls	September, November (3)	+			3
St. Mary's Roman Catholic	Central.....	Infants					

SUMMARY—continued

School Invaded	District	Department	Period of the Year	Invasion of School			No. of Cases
				Slight	Moder-ate	Severe	
St. Francis Roman Catholic.....	West Gorton ...	Infants	October, November (3)	+		3	Total cases 35.
St. Luke's Church of England.....	Newton	Infants	January, February, March, April (11), October, November (4)		+	15	
		Boys	February (3)	+		3	
		Girls	0	+		3	
St. George's Church of England...	Hulme	All Infants...	3	+		3	
St. James the Less (Board School)	Ancoats	Infants	March (3)	+		3	
St. Joseph's Convent School (Roman Catholic)	Moston.....	Mixed	February, March (6)		+	6	
St. Jude's Church of England	Ancoats	Infants	September (3).....	+		3	
St. Joseph's, Goulden Street (Roman Catholic)	St. George's ...	Infants	May, June (3)	+		3	

If, now, we refer to the unequal incidence of Scarlet Fever in different sanitary districts it will be interesting to see what relation exists between the invasion of the schools and the attack rate.

The schools most severely invaded, that is to say, the schools at which the highest number of cases appeared to have received infection, are :—

St. Mark's, Church of England, West Gorton.
 Birley Street Board School, Beswick.*
 Holy Trinity, Church of England, Rusholme.*
 Smedley Road Board School, Cheetham.
 Corpus Christi, Roman Catholic, Newton.
 Chester Street Board School, Ardwick.
 Christ Church, Church of England, Harpurhey.*
 St. Ann's, Roman Catholic, Ancoats.
 St. Barnabas, Church of England, Openshaw.
 Higher Grade Board School, Ardwick.*
 Burgess Street Board School, Harpurhey.*
 Upper Jackson Street Board School, Hulme.
 British School, Gill Street, Blackley.
 Culcheth British School, Newton.*
 Dean Lane Board School, Moston.*
 Holy Name, Roman Catholic, Chorlton-upon-Medlock.
 St. Luke's, Church of England, Newton.*
 Nelson Street Board School, Newton.
 Ten Acre Lane Board School, Newton.*
 Thomas Street Board School, West Gorton.

* Indicates twelve connected cases and upwards.

If, now, we assume that infection was actually received at school, and if we remember that the inhabitants of Moston would use the schools in Newton and Harpurhey, the excessive incidence of Scarlet Fever in Moston, Newton Heath, and Harpurhey is explained as the result of school infection.

It may be said that this is a *non sequitur*, and that the invasion of the schools may be secondary to the extension of the disease in the district.

In answer to this objection it may be said that the above is an investigation into infection occurring in schools, and is based on cases otherwise unexplained. If this is considered an insufficient answer, it remains to consider the incidence of Scarlet Fever on other schools in the same district. If the influence is a general one, then all the schools should be affected. We will, therefore, select the schools nearest to those affected, and ascertain what is the degree of infection noted in these.

Before doing so, however, we may usefully consider what are the highest attack rates on districts next to those just mentioned. The next highest attack rates occur in West Gorton, Beswick, Rusholme, Bradford, Openshaw, Ardwick, and Hulme, in the order named, then in Crumpsall and Ancoats.

No school in West Gorton reaches 12 connected cases, but it will be noted that there are two schools heavily invaded. In Beswick, Rusholme, and Ardwick, one school in each is very heavily attacked ; while in Openshaw, Ardwick, and Hulme, one school in each is severely attacked. In Bradford no single school is severely attacked, but one is moderately and two are slightly invaded.

On the other hand, one school is severely but not very severely attacked in Cheetham, Ancoats, Crumpsall, and Chorlton-upon-Medlock. The correspondence is thus a general one, and does not invariably hold ; but it is quite clear that the invasion of the schools does affect the district.

In order, however, to elucidate this matter more fully, we may institute an examination into the schools adjoining those so severely attacked. When this is done we find that in Rusholme, Hulme, and Beswick schools are very **unequally** invaded, while there is much less difference between the numbers in different schools in Newton Heath and Harpurhey ; in fact, the schools play a much smaller part in the spread of Scarlet Fever than they do in the case of Measles, though in some cases their influence is marked and unmistakable.

In conclusion, no clear evidence of any milk supply having been involved was obtained in 1900.

DIPHTHERIA, MEMBRANOUS CROUP.

The following are the tables relating to Diphtheria and Membranous Croup during the year 1900 :—

DIPHTHERIA, MEMB. CROUP, 1900.—ATTACKS IN WEEKS, ACCORDING TO DATE OF ONSET.

FIRST QUARTER			SECOND QUARTER		THIRD QUARTER		FOURTH QUARTER	
Jan.	6	10	April	7	1	July	7	18
"	13	8	"	14	2	"	14	12
"	20	11	"	21	7	"	21	11
"	27	3	"	28	3	"	28	8
Feb.	3	8	May	5	5	Aug.	4	8
"	10	7	"	12	3	"	11	7
"	17	9	"	19	2	"	18	3
"	24	2	"	26	2	"	25	5
Mch.	3	5	June	2	3	Sept.	1	1
"	10	8	"	9	3	"	8	5
"	17	9	"	16	10	"	15	6
"	24	2	"	23	7	"	22	4
"	31	4	"	30	12	"	29	6
Total...	86		Total...	60		Total...	94	
							Total...	97

City total, 337.

DIPHTHERIA AND MEMB. CROUP ATTACKS, 1900.—RATES PER 1000 LIVING, COMPARED WITH MEAN OF FIVE YEARS.

	1895	1896	1897	1898	1899	Mean	1900
Twelve Notification Towns ...	0·47	0·62	0·58	0·85	2·06	0·92	1·89
City of Manchester	0·76	0·44	0·29	0·36	0·45	0·46	0·62
Manchester Township.....	0·48	0·32	0·22	0·20	0·31	0·31	0·34
North Manchester	1·39	0·67	0·37	0·70	0·81	0·79	1·14
South Manchester	0·58	0·39	0·26	0·26	0·33	0·36	0·44

DIPHThERIA, MEMB. CROUP, 1900.—ATTACKS, DEATHS, AND CASE
FATALITY PER CENT. AT DIFFERENT AGES.

AGES	ATTACKS	DEATHS	CASE FATALITY*
Under one year.....	11	6	54'5
1 to 2 years	37	18	48'6
2 to 3 „	35	12	34'2
3 to 4 „	46	18	39'1
4 to 5 „	41	18	43'9
5 to 6 „	25	6	24'0
6 to 7 „	33	12	36'4
7 to 8 „	14	2	14'3
8 to 9 „	13	2	15'4
9 to 10 „	17	2	11'8
10 to 15 „	28	3	10'7
15 to 20 „	8	...	...
20 to 25 „	9	...	...
25 to 35 „	13	2	15'4
35 to 45 „	6	...	...
Over 45 „	1	...	...
All ages.....	337	101	30'0

* The percentages in this column are the actual proportions of fatal cases to the attacks at those ages.

DIPHThERIA, MEMB. CROUP, 1891-1900.—ATTACKS, DEATHS, AND CASE
FATALITY PER CENT. AT DIFFERENT AGES.

AGES	ATTACKS	DEATHS	CASE FATALITY PER CENT.
Under one year.....	114	84	73'8
1 to 2 years	311	200	64'3
2 to 3 „	317	183	57'7
3 to 4 „	372	170	45'7
4 to 5 „	343	136	39'6
5 to 6 „	258	103	39'9
6 to 7 „	167	49	29'4
7 to 8 „	151	35	23'2
8 to 9 „	120	20	16'7
9 to 10 „	111	15	13'5
10 to 15 „	368	26	7'1
15 to 20 „	282	15	5'3
20 to 25 „	234	7	3'0
25 to 35 „	296	11	3'7
35 to 45 „	145	4	2'8
Over 45 „	70	3	4'3
All ages	3,659	1,061	29'0

DIPHTHERIA AND MEMBRANOUS CROUP, 1900.—ATTACKS IN DISTRICTS, WITH ATTACK RATE, CASE FATALITY PER CENT., AND REMOVALS TO HOSPITAL PER CENT.

DISTRICTS	ATTACKS	ATTACK RATE PER 1000 LIVING	† CASE FATALITY PER CENT.	REMOVALS TO HOSPITAL PER CENT.
Ancoats	12	0·27	75·0	33·3
Central	26	0·83	46·1	65·4
St. George's	9	0·15	44·4	44·4
Cheetham	106	2·84	13·2	75·5
Crumpsall	18	2·11	11·1	77·7
Blackley	3	0·34	...	100·0
Harpurhey	12	0·81	41·7	41·7
Moston	8	0·71	37·5	25·0
Newton Heath	14	0·38	42·9	21·4
Bradford	16	0·69	50·0	12·5
Beswick	3	0·26	...	66·7
Clayton	2	0·26	...	100·0
Ardwick	7	0·17	57·1	42·9
Openshaw	12	0·45	16·7	66·7
Gorton (West)	9	0·33	33·3	55·6
Rusholme and Kirk.	20	0·79	35·0	50·0
Chorlton-on-Medlock	21	0·36	42·8	47·6
Hulme	39	0·57	33·5	38·4
City of Manchester	337	0·62	30·0	56·1

† Corrected : the fatal cases are those actually occurring amongst the cases notified.

DIPHTHERIA, MEMB. CROUP MORTALITY, 1900.—RATE PER 1000 LIVING, COMPARED WITH MEAN OF FIVE YEARS.

	1895	1896	1897	1898	1899	Mean	1900
England and Wales	0·25	0·29	0·24	0·24	0·29	0·26	0·27
33 Great Towns	0·36	0·38	0·31	0·31	0·40	0·35	0·35
London	0·53	0·60	0·51	0·40	0·43	0·49	0·34
Manchester City	0·21	0·15	0·08	0·09	0·16	0·14	0·19
Manchester Township	0·16	0·13	0·08	0·06	0·12	0·11	0·18
North Manchester	0·37	0·23	0·10	0·15	0·26	0·22	0·23
South Manchester	0·16	0·12	0·08	0·08	0·11	0·11	0·16
67 Smaller Towns	0·23	0·25	0·24	0·28	0·28	0·26	0·29
Rural Districts	0·19	0·23	0·19	0·18	0·21	0·20	0·23

From the foregoing tables it will be seen that in 1900 there was an advance in the number of cases of Diphtheria on the year 1899, and that the fatality was also greater in the former year. On reference to the table showing the incidence of Scarlet Fever, it will be seen that that disease reached its lowest point in 1898, and that the number of cases has since rapidly increased.

The death-rate from Diphtheria has pursued the same course, and it is permissible to connect the two, since Scarlet Fever and Diphtheria are very liable to be confounded. There is, however, no autumnal rise in the number of cases of Diphtheria corresponding to the autumnal rise of scarlet fever. Indeed in 1900 the most rapid increase takes place in the end of June. In regard, also, of the proportion of deaths to cases notified the two diseases behave differently, the mortality rate of Diphtheria cases diminishing with advancing years up to the ages 35-45, while that of Scarlet Fever reaches a minimum at the ages 10-15.

Further, the attacks do not have the same distribution in the City. In 1900, Cheetham and Crumpsall were severely visited by Diphtheria, and then, at a long interval, the Central District, Harpurhey, and Moston, these last being districts contiguous to those most affected.

Looking merely at the number of attacks, we see that the number occurring in Cheetham is nearly one-third of the total number of cases. Taking larger areas, the attack rate in North Manchester was considerably more than double that in South Manchester, and more than thrice that of the Manchester Township.

There was not, however, the same disproportion in the death-rates. Diphtheria has a peculiar interest, inasmuch as we have endeavoured, by means of the bacteriological examinations conducted by Professor Delépine, to ascertain exactly where cases were occurring and where they only presented the appearance of Diphtheria :—

BACTERIOLOGICAL EXAMINATIONS.

1	2		3	4	5	6	7	
Total Number of Cases submitted to Examin- ation	Positive Results		Negative Results	Number in which Negative Result was accepted	Diag- nosis adhered to where no Bacilli were found	Number in which the diagnosis has been made without confir- mation	Cases examined outside Hospital	
	Ordinary Form	Short Form					Positive	Negative
920	128	35	335	252	83	55	111	281

BACTERIOLOGICAL EXAMINATIONS—*continued.*

8		9		10		11
Cases examined inside Hospital						Number admitted without previous examination
After Admission		Post Scarlatinal		On Recovery		
Positive	Negative	Positive	Negative	Positive	Negative	
52	54	90	166	26	140	115

Columns Nos. 7 and 8 are included in columns Nos. 2 and 3, but not Nos. 9 and 10.

The total number of cases submitted to bacteriological examination has been during the year 920.

Of these, 335 gave a negative result ; in 252 of these cases the bacteriological result was accepted by the medical practitioners. A large number, however, were sent into hospital on the urgent representation of the medical practitioners without previous bacteriological examination, and the following figures relate to cases finally determined as Diphtheria either by medical practitioners or by the Medical Superintendent of Monsall Hospital. The total number of cases is 309. Of these, eight are certainly diagnosed as disease other than Diphtheria.

The remainder are classified as follows :—

(1) CASES REMOVED TO THE HOSPITAL.

	Bacteriological examination gave a positive result		Bacteriological examination gave a negative result	Bacteriological examination not made	Total
	Ordinary Form	Short Form			
Cases	19	14	53	22	180
Deaths	11	1	3	20	35

(2) CASES NOT REMOVED TO THE HOSPITAL.

	Bacteriological examination gave a positive result		Bacteriological result negative	No Bacteriological examination	Total
	Ordinary Form	Short Bacilli			
Cases	50	10	28	33	121
Deaths	11	3	11	17	42

It will be seen that the fatality is much greater amongst cases treated outside than amongst cases treated in the hospital. That is only to be expected from the systematic application of the antitoxin treatment to cases removed to the hospital.

On the other hand, the extremely low mortality amongst cases treated in hospital, and giving a negative reaction, is calculated to throw doubt on the nature of many of those cases.

As regards the high fatality in cases not submitted to bacteriological examination, that is explained by the difficulty in taking specimens from very severe or moribund cases. The occurrence of 81 negative results, however, among 301 cases of diphtheria is a serious matter, and is calculated to shake the degree of confidence which we have placed on those examinations. No doubt there are factors which will always cause a number of genuine cases of diphtheria to fail in yielding a positive bacteriological result. Among such causes are—

1. The failure to take a sufficiently firm swab.
2. Previous treatment of the throat with antiseptics.
3. Delay in taking a specimen. In many cases the bacilli disappear at an early period, and this will be particularly liable to happen in hospital with a successful serum treatment.

Nevertheless, the above proportion was so high as to require special consideration, and I have therefore made an analysis of the negative cases, which is herewith given :—

NEGATIVE CASES.

Cases	Particulars	Hospital	Died
7	Sudden onset quinsy (?)	—	—
4	Onset December 22nd. Specimen not collected till January 4th.	+	—
25	Onset like scarlet fever, January 19th. Bacteriological examination delayed.	—	—
26	Same house as positive case. Onset January 6th. Removed to hospital January 11th. Bacteriological examination January 11th.	+	—
30	Very doubtful case. Onset January 20th. Bacteriological specimen taken January 29th.	+	—
39, 40	Very doubtful cases. Medical attendant would not regard these as diphtheria were it not that they reside in the same house as 34, which gives a positive reaction.	—	—
50	Brother returned from Monsall on January 26th, having had scarlet fever. Attack of No. 50 began February 9th, notified February 17th. Bacteriological examination February 14th.	—	+
56	Same house as case 55 +. No account of early symptoms given. Seems to have given rise to doubts of scarlet fever.	+	—
57	Removed to Clinical Hospital on February 26th. Died same day. Throat very painful. Took ill February 25th.	+	+
60, 61	Onset February 28th. Bacteriological examination March 6th. Both negative, yet 3 subsequent cases in the same house all positive. Onset March 1st. Bacteriological examination March 6th.	+	—
68	Taken ill March 10th. Specimen taken March 16th. Reads like scarlet fever.	+	—
69	Onset typically like diphtheria. Reference to previous case not found. M.C.	+	—
73	A case of membranous croup	—	+
75	Medical attendant undecided as to diagnosis	—	—
76	History might be one of scarlet	—	+
79	Illness began like diphtheria. Specimen taken after death certified diphtheria and pneumonia. Onset March 27th. Bacteriological examination April 5th.	—	+
81	Onset rather like scarlet fever. Onset April 8th. Specimen not collected till April 17th.	+	—
83	Monsall diagnosis diphtheria. Onset April 14th, removed April 15th. Specimen not collected till April 24th.	+	—

NEGATIVE CASES—*continued*

Cases	Particulars	Hospital	Died
91	Previous case in same house (one specimen taken) died in Monsall. Present case has a history like that of scarlet fever. Previous case, onset April 20th. Present case, onset April 28th. These children have been playing with two children discharged from Monsall on April 17th, next door but one. These were sent in as scarlet fever, and one had also diphtheria. Specimen taken May 3rd.	+	—
97	Reads like scarlet fever. Hospital diagnosis doubtful	+	—
108	Illness came on sharply after an operation on the throat for long-standing disease : not improbably septic.	+	+
115	No information. Onset June 19th. Specimen not collected till July 10th.	+	—
117	Onset June 15th, removed June 19th. Specimen July 4th	+	—
119	Symptoms not conclusive. Onset June 16th. Specimen July 9th	+	—
120	Brother has recently suffered from otorrhœa. Onset June 21st. Removed to hospital June 23rd. Specimen taken July 18th.	+	—
121	Symptoms indeterminate. Onset June 22nd, removed June 24th. Specimen July 20th.	+	—
127	Possibly scarlet fever. Onset June 27th. Specimen July 4th. Convalescing at last date.	—	—
130	Taken suddenly ill, also 128 and 129, of whom 128 died.	—	+
132	Onset July 2nd. Removed to hospital July 3rd. Bacteriological examination August 6th. Symptoms inconclusive.	+	—
134	Onset July 2nd. Removed to hospital July 4th. Specimen taken July 10th. Onset sudden. Possibly scarlet fever.	+	—
137	Subsequent case a week later +. Symptoms here indeterminate.	+	—
141	Cases 131, 140, and 142 +. In all four cases the attack was sudden.	+	—
150	Symptoms indeterminate. Onset July 8th. Removed to hospital July 10th. Specimen August 6th.	+	—
154	Onset July 1st. Removed July 13th. Specimen taken on recovery.	+	—
157	Onset July 12th. Removed July 13th. Specimen July 12th.	+	—
100	Onset July 16th. Removed July 19th. Specimen August 13th.	+	—
172	Brother at same time gave positive result. Onset of 172, July 16th. Specimen July 30th.	—	—
173	Onset July 24th. Removed July 26th. Specimen August 21st.	+	—
177	Slight sore throat.....	—	—

NEGATIVE CASES—*continued*

Cases	Particulars	Hospital	Died
183	This case commenced sharply with fever. Onset August 2nd. Specimen August 3rd.	+	—
185	Onset very sharp with fever. Previous cases 119 (negative), 182 (+)	+	—
190	Symptoms of diphtheria typical. Brother gave positive reaction.	—	+
192	Symptoms indeterminate	+	—
196	Onset sudden	+	—
197	Onset strongly suggests diphtheria	+	—
204	Brother a case of scarlet fever, returned August 17th. Onset of 20 + August 25th. Onset suggests scarlet fever, except for eruption.	+	—
208	Ill September 7th. Removed September 9th. Specimen September 26th. Onset somewhat sudden. Indeterminate.	+	—
213	Onset September 15th. Removed September 16th. Specimen September 20th. Previous cases 208 and 211, the former negative, the second doubtful. Onset resembles scarlet fever.	+	—
215	Symptoms indeterminate. Onset September 16th. Removed September 17th. Specimen September 17th.	+	—
217	Symptoms indeterminate. Onset September 17th. Removed September 19th. Specimen September 26th.	+	—
219	Tonsillitis. (?) Also sister	—	—
220	Ill September 13th. Possibly scarlet fever. Died September 15th.	—	+
221	Discharged as tonsillitis	+	—
223	Onset September 27th. Removed September 28th. Specimen September 29th. Case indeterminate evidently.	+	—
226	Tonsillitis	+	—
231	Commenced with bronchitis. Died suddenly soon after returning from Monsall, apparently well. Onset September 30th. Removed October 7th. Specimen collected October 11th	+	+
237	Companion of sister of a man who died September 19th of scarlet fever. Symptoms indeterminate. Not severe.	—	—
239	Child has been ill with diarrhoea and tabes. Medical man attending since September 29th on account of throat affection. Child removed to hospital on October 11th. Sister removed on October 8th suffering from scarlet fever.	+	—
245	Attack sudden and severe at school with vomiting. Onset October 10th. Removed October 16th. Specimen taken October 28th.	+	—
249	Symptoms point to diphtheria	—	—

NEGATIVE CASES—*continued*

Cases	Particulars	Hospital	Died
257	Onset October 16th. Removed October 26th. Specimen November 4th.	+	—
257	On October 29th had pain in the throat. Brother removed 13 days previous—positive. Two specimens taken, both negative, both prior to onset of illness.	—	—
258	Onset November 1st, with soreness of mouth, like thrush. Removed to hospital November 5th. Specimen November 12th.	+	—
260	Negative. Medical attendant agrees not diphtheria...	—	+
262	Scarlatinal eruption. Death certified as diphtheria. Attack began very suddenly. Scarlet fever (?) ...	—	—
265	Symptoms indeterminate, point rather to diphtheria than scarlet.	+	—
268	Symptoms point rather to scarlet fever, but indeterminate. Onset November 16th. Removed November 19th. Specimen November 17th, unsatisfactory.	+	—
270	Symptoms like diphtheria. Previous case positive. Satisfactory specimen could not be obtained.	+	—
274	Symptoms point rather to scarlet fever	+	—
275	Broncho pneumonia	+	—
278	Broncho pneumonia (?). Onset November 12th, taken to out-patient room November 14th. Sister also died about same time. No specimen taken.	—	+
282	Onset November 26th. Removed November 30th. Specimen December 2nd. Symptoms indeterminate.	+	—
284	Onset November 29th. Removed December 1st. Specimen December 2nd. Some paresis, but onset like scarlet fever.	+	—
292	Symptoms indeterminate, but rather favour diphtheria than scarlet fever.	+	—
297	Symptoms indeterminate. Onset December 8th. Removed December 13th. Specimen December 13th.	+	+
301	Symptoms rather indicate scarlet fever (Burgess Street Board School). Onset December 16th. Removed December 20th. Specimen December 23rd. Said to have had difficulty of speech in hospital.	+	—
302	Onset November 23rd. Died December 20th. Specimen December 8th.	—	+
307	Tonsillitis	+	—
308	Onset sudden on December 23rd. On December 28th had a general enythema, and medical attendant was called in. Probably scarlet fever. On December 6th child's mother was removed to hospital with enteric fever.	+	—

We shall be quite safe if we say that the bacteriological examination is of no value for diagnostic purposes if made 10 days or upwards after the onset of the disease. This is no case of doubting the nature of the attack. It is purely a question of the value of the examinations. In the following cases, chiefly in those removed to hospital without a previous swab being taken, the negative result must be regarded as having no diagnostic significance :—

	Cases
4, 26, 50, 83, 115, 117, 119, 120, 121, 132, 150, 154, 166, 172, 173, 208, 223, 231, 245, 251, 258, 302...	22
In 257 the test was made before the illness commenced	1
In the following cases also the interval after the onset was too long :—	
127 8 days	} 5
30, 79, 81, 217 9 days	
Total.....	28

There are also others in which a swab was taken in hospital after the commencement of serum treatment, in which the diagnostic value is necessarily impaired.

In the following negative cases doubts might reasonably be cast on the diagnosis of Diphtheria—7, 25, 30, 39, 40, 50, 57, septic (?). 68, 75, 81, 97, 108, septic (?). 120, 127, 177, 183, 204, 219, 221, 226, 237, 239, 245, 258, 260, 262, 274, 275, 278, 307, 308. Of these, four have already occurred under delayed specimens, and there remain 27 cases.

Adding these to the previous group, we get 56 cases in which either the diagnosis is open to doubt or the examination is made too late to give a result of any diagnostic importance. There remain, however, 25 cases to which these exceptions do not apply.

In a number of these 25, however, the bacteriological examination did not reveal bacilli, though Diphtheria was probably present.

The cases especially suggestive in this connection are 60 and 61, 137, 141, 185, 190, 197, 257, 270, 284. Thus, in as many as 10 out of the 25, *primâ facie* evidence is tolerably conclusive that the cases had Diphtheria, and it must therefore be admitted that, from one or another cause, a certain percentage of failures must result. The important questions which we have to consider is how far such failures are conducive to cases at home being overlooked, and whether, therefore, if we were to trust too implicitly to the results of bacteriological examination in the case of Diphtheria we may not be doing harm. This can be settled by a very laborious process, but one which in view of the importance of the question must be undertaken, viz. : by a com-

parison of those addresses from which cases accepted as negative have come, with the addresses of received cases of Diphtheria.

The bacteriological diagnosis of Diphtheria has not, for the reasons given, been so secure as that of Enteric Fever, and the majority of medical men know this, and make allowance for it. It is, nevertheless, as well that it should be stated that a negative result is not absolutely to be relied upon, but must be taken along with the initial symptoms, and with the nature and the history of the case.

The facts of infection may be briefly exhibited in the following summary, which shows the relation between the bacteriological examinations in each case (+ = bacilli found, - = bacilli not found, 0 = no specimen taken).

Taking first cases with a clear history of infection, the onsets being separated by an interval of time not exceeding eight days, we get :—

Case infected	Case infecting	Case infected	Case infecting	Case infected	Case infecting
	+	0	+ — +	+	+ +
	0	+	+	+	+
Delayed	—	0 +	+	—	+
	+	+ —	+	+	+
+ + +	— —	+	?	+ +	+ or common source
	0	+	+	—	+
	+	+	—	—	—
	+	0	+ +	+	+ (?)
	+	+	+	0	—
—	0	+	+	—	0 —
+	+	+	+	+	+
+	0	+ (?)	—	+	+ +
—	0	—	+ (?) —	—	—
+	+			+	+
+	—			0	+
				0	0
17		16		17	

Thus a clear history of direct infection was obtained in 50 cases. Of these, in 21 instances only were bacilli found in both infecting and infected cases.

It is quite possible in some of these cases that infection may have been contracted elsewhere than at home, as, for example, at an infected school. But the more apparent source has been taken.

In the case of four schools, invasion took place during the year ; and the following cases were ascribed to the school at which they occurred :—

St. Mary's, Hulme	Thomas Street Wesleyan, Salford	Derby Street Jews	Southall Street Jews	Burgess Street Board School, Harpurhey
+	+	—	+	+
—	+	+	—	+
	—	+	++	—
		—	—	+

Total, 17.

In the last-named school, the cases occurred as a little outbreak towards the end of the year in the infant department.

The following cases were clearly traced to previous overlooked cases :—

OVERLOOKED CASES.

Infected	Infecting
+	0
+++	0 0 0—0 0
+	0
+	0 0

10.

Properly speaking, there are here 10 cases, since in the second series the last one in the series was clearly the origin of all the others.

In four instances the patients are recorded as having been in relation with cases returned from the hospital :—

INFECTED	INFECTING (?)
22+Onset January 18th	Sister suffering from scarlet fever, returned home January 12th.
154—Onset June (?)	Playmate returned from hospital on June 6th.
204—Onset August 25th	Brother in hospital with scarlet fever, returned August 17th.
224 Onset September 23rd	On September 22nd played with a case of scarlet fever, returned from hospital on September 21st.

4 cases.

The following cases are also of interest :—

Case 28 Bact. O. Five others have had influenza, and this may be of the same nature,

Case 69—Ascribed to a previous case ; no record found.

Case 82+ Probably from visit to an infected house outside Manchester.

Case 135+ Previous case at home, positive, removed 20 days previous.

Case 180+ Ascribed to previous case at home, interval between removal of first case and onset 14 days.

Case 181+ Ascribed to previous case at home, interval between removal and onset 25 days.

Case 183—Ascribed to previous case as above, interval 10 days.

Case 251—Ascribed to visiting infected house which cannot be traced.

Case 256+ Mother went with case in hospital van two days before onset.

Case 119—Specimen taken late ; brother had sore throat six weeks before.

Case 295 Previous cases contracted in same hospital.

Case 239—Sister had scarlet fever.

Thus we have 10 cases with a reasonably good explanation of the attack, giving in all 87, or, if we add the hospital cases, 91 cases in which the infection was traced.

No doubt, however, many sources of infection are altogether overlooked. As an example of how easily this may occur, I insert here the account given by Dr. Coates of the history of infection at 13, Bent Street, Cheetham, which previous inquiry had failed to elicit. I requested Dr. Coates to look into the case, and the following is his statement :—

*Investigation of Four Cases of Diphtheria at 13, Bent Street,
Cheetham.*

A—— F——, aged $6\frac{1}{2}$ years, of 15, Bent Street, complained of lassitude and weariness on Saturday, December 9th, and on Sunday,

December 10th, of headache and sore throat. She did not want to get up on Monday morning, but was, however, sent to school (Jews' School, Derby Street). In the afternoon she was too ill to go to school—headache and throat worse—and was kept at home, but no doctor called in. In a day or two she improved, and by Saturday, December 16th, was nearly well. On the Thursday or Friday, December 14th or 15th, her brother, 9 months old, began with similar symptoms, and on Saturday the 16th Dr. — was called in. This boy was removed to Monsall on the 19th December, and died from diphtheria on December 23rd.

At 17, Bent Street, lives Mrs. B—— and her daughter, the mother and sister of Mrs. F——, of 15, Bent Street. Miss B—— was constantly in and out of No. 15, helping to nurse the boy while he was ill, and on December 18th she began with sore throat, and was ill in bed until December 30th, when she sat up in the afternoon and the following afternoons in the parlour, and got back to her work on January 6th (cigar maker, Hargreaves). Dr. — was in attendance, and said she had “ulcerated throat.”

On December 31st Mary Ellen C——, aged 14, of 13, Bent Street, visited Miss B——, and sat with her the whole afternoon. Twenty-four hours later, January 1st, Mary Ellen began with sore throat, and went to Dr. — who said she had tonsillitis, and gave her a gargle. She improved, and in three or four days was well again. On January 4th her brother George, aged 4 years, complained of sore throat, and on the 5th three other children—Dora, James, and Fred—began. George died January 11th; the others are improving. The girl Mary Ellen is a servant at —, but was at home on December 31st, and slept at home on January 1st, 2nd, 3rd, and 4th.

Since about December 10th there has been no communication between No. 13 and Nos. 15 and 17, except the visit of Mary Ellen on the afternoon of December 31st, and also on January 3rd. Mrs. F—— (No. 15) handed to the girl Dora C—— at the front door a soothing powder, which Mrs. C—— immediately burned. With this exception, no toy or other article has passed from one house to the other. The C—— children have not been to day school since December 21st, nor to Sunday School since December 24th. They have not been to any parties, etc., nor visited any houses, nor has anyone visited them, because Mrs. C—— says “they know no one in Manchester.” They have had no visitors from Leeds or other places.

Family History :—Have lived in this house eight months, and in Manchester one year. Before that, lived in Leeds. Mrs. C——, Mary Ellen, and Dora, when living in Leeds, were subject to sore throat, and had several attacks. Since coming to Manchester they have been free from sore throats, except in October, 1899, when Mrs. C—— and Mary Ellen had slight attacks, which lasted about a week, but did not prevent them from doing their usual work.

Paralysis and Paresis as Sequelæ, as ascertained by the Sanitary Inspectors.

The following form is given to the Sanitary Inspectors, on which they may ascertain the paralytic or paretic sequelæ of the disease :—

Sanitary District No.....

Name

Address

Date of Attack.....

The Sanitary Inspector to ascertain after recovery of the patient whether there has been any paralysis or weakness observed, following on the illness?

Whether, in the course of recovery, the parents have noticed any paralysis which would show itself as temporary?

1. Drooping of eyelids or loss of vision.....
2. Nasal speech, difficulty in swallowing
3. Difficulty in breathing.....
4. Sudden death during apparent recovery
5. Any other loss of power which the parents may have observed.....

Remarks

.....

.....

.....

..... Sanitary Inspector.

From these forms the following results are compiled, which may be advantageously compared with the result of skilled observations in the hospital :—

PARALYSIS AS A SEQUELA ASCERTAINED BY THE SANITARY INSPECTOR WHEN VISITING THE HOMES IN CONNECTION WITH DISINFECTION, ETC.

Cases	Bacteriological Result	Hospital
<i>Positive</i>		
22	Weakness of the lower limbs	+
45	Slight affection of the eyes + short	—
49	Loss of vision + short	+
55	Slight loss of power, right leg	+
86	Difficulty in swallowing	+
87	Paresis legs and arms + short form	—
90	Voice affected	—
105	Paralysis of speech, nose, swallowing, legs—sudden death..	—
118	Slight difficulty in swallowing.....	—
124	Paresis lower limbs	+
152	Nasal speech.....	+
168	Loss of vision	+
<i>Negative</i>		
215	Difficulty in swallowing	+
219	Neuralgia and slight deafness	+
231	Sudden death after return home.....	+
245	Myopia, paresis of chest	+
251	Nasal speech	+
258	Nasal speech, breathing impeded	+
270	Drop of eyelids, weak legs	+

PARALYSIS AS A SEQUELÆ—*continued*

Cases	Bacteriological Result	Hospital
<i>Negative—continued</i>		
284	Nasal speech, paresis of legs	+
302	Paralysis of velum, sudden death	—
308	Nasal speech.....	+
Hospital, 9 ; Outside, 1.		
<i>None taken.</i>		
59	Respiration and swallowing affected	—
109	Difficulty in swallowing	—
126	Paresis of legs	—
264	Nasal speech, breathing impeded	—
Outside, 4.		
<i>Paralysis—Positive Diagnosis.</i>		
178	Loss of vision, nasal speech.....	—
180	Weakness of legs.....	+
194	Slight difficulty in swallowing	—
240	Difficulty in swallowing	+
246	Speech and legs affected	—
263	Nasal speech, breathing impeded	+
271	Nasal speech, pain in back.....	+
283	Nasal speech, breathing impeded	—
		20
Hospital.....		11
Outside		9

It may be surmised that the loss of power which follows on the disease is, in some of these, confounded with the nasal speech, difficulty of swallowing, etc., appertaining to the earlier stages of the attack.

It will be noted that all of the negative cases to the number of 10 showing paralytic or paretic sequela, except one, are in the Hospital, and that in five of the ten specimens were taken too late to be of value in diagnosis.

Dr. Marsden has been good enough to supply me with an account of the paralytic and paretic sequelæ in cases occurring in the Hospital :—

PARALYTIC AND PARETIC SEQUELÆ OCCURRING IN CASES TREATED IN
MONSALL HOSPITAL.

Cases		Bacteriological Diagnosis
5	Paralysis of palate	+
22	Paralysis of palate	+
37	Paralysis of palate. Strabismus. Cardiac irregularity	+
49	Cardiac irregularity.....	+ Short
64	Slight cardiac irregularity	+
72	Cardiac irregularity.....	None taken
95	Paralysis of palate. Cardiac irregularity	+
102	Slight cardiac irregularity	+
108	Paresis legs. Paresis diaphragm. Strabismus. Difficulty in swallowing. Cardiac irregularity	—
110	Paralysis of palate	+ Short
113	Paralysis of palate. Strabismus. Cardiac irregularity	+
115	Slight cardiac irregularity	— Collected late
124	Cardiac irregularity.....	+
136	Cardiac irregularity.....	+
144	Paralysis of palate. Cardiac irregularity	+
148	Cardiac irregularity.....	+
150	Slight cardiac irregularity	—
152	Paralysis of palate. Cardiac irregularity	+
158	Strabismus. Cardiac irregularity, slight embryo- cardia	+
160	Slight cardiac irregularity	+ Short
163	Paralysis of palate. Paralysis diaphragm. Strabismus. Cardiac irregularity	+
165	Paralysis of palate. Cardiac irregularity, embryocardia	+ Short
166	Paralysis of palate, embryocardia	— Collected late
169	Slight cardiac irregularity	+
180	Slight cardiac irregularity	+
181	Slight cardiac irregularity	+
192	Slight cardiac irregularity	—
196	Paralysis of palate. Paralysis of diaphragm. Paralysis of larynx	—
199	Slight cardiac irregularity	+
204	Cardiac irregularity.....	— Collected ninth day of illness
208	Slight cardiac irregularity	— Collected late
211	Slight cardiac irregularity	+
212	Cardiac irregularity.....	+

PARALYTIC AND PARETIC SEQUELÆ--continued.

Cases		Bacteriological Diagnosis
214	Paralysis of palate	+
217	Paralysis of palate	— Collected ninth day of illness
238	Paralysis of palate	+
250	Paralysis of palate. Strabismus. Cardiac irregularity	+
252	Paralysis of palate	+
268	Strabismus	— Specimen unsatis- factory
284	Cardiac irregularity.....	—
301	Cardiac irregularity.....	— Collected seventh day of illness

INSANITARY CONDITIONS FOUND IN CONNECTION WITH DIPHTHERIA.

The following is an analysis of the position of the closets in connection with the cases not traced to any previous case at home, according as the bacteriological examination was positive or negative, or none was made :—

BACTERIOLOGICAL EXAMINATION—POSITIVE.

Pail			Midden				
Adjoins	Under 4ft.	4ft. and over	Adjoins	Under 6ft.	6ft. and over	W. C.	W. W. C.
44	0	25	2	2	16	28	0

BACTERIOLOGICAL EXAMINATION—NEGATIVE.

Pail			Midden				
Adjoins	Under 4ft.	4ft. and over	Adjoins	Under 6ft.	6ft. and over	W. C.	W. W. C.
22	0	20	2	2	4	11	0

NO BACTERIOLOGICAL EXAMINATION MADE.

Pail			Midden				
Adjoins	Under 4ft.	4ft. and over	Adjoins	Under 6ft.	6ft. and over	W. C.	W. W. C.
25	0	3	1	0	7	11	0

Of the negative cases, 3 must be subtracted from the pail-closets adjoining, making the number in this column 19, as the cases were diagnosed as not Diphtheria, and 1 must be added to the column 4ft. and over, as in one instance there was a W. C. and pail over 18ft. at the same house, the former having been entered in the W. C. column only.

On examining the above figures, the results are very striking, and the preponderance of the pails adjoining houses over those at some distance would appear to correspond to the severity of the disease.

With regard to other insanitary conditions noted, it is impossible to represent these very succinctly, but they are completely analysed as follows :—

	Bact. Examination Positive	Bact. Examination Negative	No Specimen taken
Drains defective.....	12	1	8
Drains and yard defective.....	3	1	3
Drains defective, house dirty.....	2	...	...
Drains and yard and pail closet defective	...	1	1
Drains defective, ashplace sunk, house dirty and in disrepair.....	1	...	...
Drains defective and cellar floor defective	1	...	...
Drains and yard defective, house damp...	1	...	...
Drains and yard and midden defective...	1	...	...
Drains defective and house overcrowded	...	...	1
Defective yard	7	3	0
Yard and slop-pipe.....	...	...	1
Yard and closet .....	...	1	...
House overcrowded .....	...	1	...
House damp .....	...	...	1
House damp, and disrepair .....	...	1	...
House in disrepair.....	1	...	...
House dirty	5	...	1
House dirty and damp	1	...	...
House dirty, overcrowded, and in dis- repair	1	...	...
House dirty, in disrepair, and the closet defective.....	...	...	1
Passage offensive	1	...	...
	37	9	17

It is true that not nearly all the defects existing are or can have been recorded, but, taking those noted as being, on the whole, the most striking, it is interesting to compare them with the number of cases which stand, as follows :—

Giving a positive bacteriological result	Giving a negative bacteriological result	No specimen taken
165	81	55

Thus the number of defects noted are nearly as 1 to every 3 cases in which no specimen was taken, as 1 to every 4½ cases in which the bacteriological examination gave a positive result, and as 1 in every 9 cases in which the bacteriological examination gave a negative result, which agrees with the indication furnished by analysis of the closets.

So far, then, as these results go, they seem to indicate a connection between the occurrence of Diphtheria and the insanitary conditions named in the summary.

Additional effort is required in tracing out obscure or overlooked cases, and in getting an early examination made of swabs from the throat. During the past year the Committee agreed to pay a fee in consideration of the trouble incurred by the Medical Attendant in taking a specimen. No improvement has so far followed on this fee, which is an additional burden justifiable only by results.

ENTERIC FEVER.

The following are the tables referring to this disease :—

ENTERIC FEVER ATTACKS REPORTED IN QUARTERS.

	FIRST QUARTER	SECOND QUARTER	THIRD QUARTER	FOURTH QUARTER
1891	173	119	180	289
1892	164	106	156	184
1893	108	80	220	210
1894	118	75	135	132
1895... ..	110	90	100	193
1896	118	130	108	157
1897	97	57	137	212
1898	143	79	134	286
1899	101	66	104	110
1900	85	78	103	112

We may now return to the course of Enteric Fever in Manchester in 1900.

ENTERIC FEVER ATTACKS IN WEEKS REPORTED IN 1900, ACCORDING
TO DATE OF ONSET.

FIRST QUARTER		SECOND QUARTER		THIRD QUARTER		FOURTH QUARTER	
Jan. 6	11	April 7	12	July 7	...	Oct. 6	14
" 13	8	" 14	11	" 14	...	" 13	19
" 20	7	" 21	7	" 21	3	" 20	11
" 27	10	" 28	8	" 28	6	" 27	10
Feb. 3	2	May 5	8	Aug. 4	7	Nov. 3	10
" 10	7	" 12	4	" 11	9	" 10	5
" 17	5	" 19	3	" 18	9	" 17	12
" 24	7	" 26	3	" 25	8	" 24	7
Mch. 3	4	June 2	2	Sept. 1	13	Dec. 1	8
" 10	5	" 9	7	" 8	10	" 8	9
" 17	3	" 16	5	" 15	12	" 15	3
" 24	10	" 23	6	" 22	9	" 22	1
" 31	6	" 30	2	" 29	17	" 29	3
Total...	85	Total...	78	Total...	103	Total...	112

City Total 378

ENTERIC FEVER ATTACKS, 1900.—RATES PER 1000 LIVING, COMPARED
WITH MEAN OF FIVE YEARS.

	1895	1896	1897	1898	1899	Mean	1900
Twelve Notification Towns...	1·45	1·38	1·32	1·53	1·60	1·46	1·12
City of Manchester	0·94	0·95	0·94	1·19	0·70	0·94	0·70
Manchester Township.....	0·70	0·88	0·81	1·29	0·77	0·89	0·65
North Manchester	0·98	1·11	0·97	1·42	0·73	1·04	0·80
South Manchester	1·06	0·91	0·99	0·99	0·64	0·92	0·65

ENTERIC FEVER (1900) ATTACKS IN DISTRICTS, WITH ATTACK RATE,
CASE FATALITY PER CENT., AND REMOVALS TO HOSPITAL PER CENT.

DISTRICTS	ATTACKS	ATTACK RATE PER 1,000 LIVING	† CASE FATALITY PER CENT.	REMOVALS TO HOSPITAL PER CENT.
Ancoats	30	0·66	20·0	66·7
Central	17	0·54	29·4	76·5
St. George's	42	0·70	14·3	69·0
Cheetham	23	0·62	13·0	39·2
Crumpsall	7	0·82	28·6	57·1
Blackley	10	1·12	20·0	50·0
Harpurhey	23	1·55	4·3	43·5
Moston	4	0·36	...	50·0
Newton Heath	23	0·63	4·3	60·9
Bradford	21	0·90	38·1	57·1
Beswick	7	0·61	14·3	57·1
Clayton	10	1·32	30·0	60·0
Ardwick	25	0·61	4·0	72·0
Openshaw	35	1·30	34·3	68·6
Gorton (West)	24	0·87	20·8	70·8
Rusholme and Kirk...	7	0·28	...	42·9
Chorlton-on-Medlock..	26	0·44	23·1	46·1
Hulme	44	0·65	13·6	68·2
City of Manchester.	378	0·70	18·0	61·4

† Corrected ; the fatal cases are those actually occurring amongst the cases notified.

ENTERIC FEVER, 1900.—ATTACKS, DEATHS, AND CASE FATALITY PER
CENT. AT DIFFERENT AGES.

AGES	ATTACKS	DEATHS	CASE FATALITY PER CENT.
Under one year.....	...	...	...
1 to 2 years .....	...	...	...
2 to 3 „	3	...	...
3 to 4 „	1	1	100·0
4 to 5 „	7	...	...
5 to 6 „	7	1	14·3
6 to 7 „	7	1	14·3
7 to 8 „	12	..	...
8 to 9 „	8	1	12·5
9 to 10 „	13	1	7·7
10 to 15 „	41	6	14·6
15 to 20 „	63	10	15·9
20 to 25 „	61	12	19·7
25 to 35 „	83	16	19·3
35 to 45 „	41	10	24·4
Over 45 „	31	9	29·1
All ages.....	378	68	18·0

ENTERIC FEVER, 1891-1900. ATTACKS, DEATHS, AND CASE FATALITY PER
CENT. AT DIFFERENT AGES.

AGES	ATTACKS	DEATHS	CASE FATALITY PER CENT.
Under one year.....	6	4	66·7
1 to 2 years	26	8	30·8
2 to 3 „	55	8	14·5
3 to 4 „	96	17	17·7
4 to 5 „	140	15	10·7
5 to 6 „	156	20	12·8
6 to 7 „	147	18	12·2
7 to 8 „	142	15	10·6
8 to 9 „	153	13	8·5
9 to 10 „	144	14	9·7
10 to 15 „	823	98	11·9
15 to 20 „	921	179	19·4
20 to 25 „	822	163	19·8
25 to 35 „	963	246	25·6
35 to 45 „	468	155	33·1
Over 45 „	297	112	37·7
All ages	5,359	1,085	20·2

ENTERIC FEVER MORTALITY, 1900. RATE PER 1000 LIVING, COMPARED
WITH MEAN OF FIVE YEARS.

	1895	1896	1897	1898	1899	Mean	1900
England and Wales	0·17	0·17	0·16	0·18	0·20	0·18	0·16
London.....	0·14	0·13	0·13	0·14	0·18	0·14	0·17
Dublin	0·29	0·45	0·58	0·49	0·55	0·47	0·38
City of Manchester	0·18	0·22	0·18	0·22	0·13	0·19	0·14
Manchester Township	0·18	0·28	0·17	0·25	0·15	0·21	0·14
North Manchester	0·16	0·18	0·20	0·24	0·11	0·18	0·14
South Manchester	0·19	0·20	0·17	0·19	0·14	0·18	0·14

There were 378 cases of Enteric Fever notified during 1900, which is a decrease of 3 as compared with the previous year.

The attack rate per 1,000 persons living was 0·70, which is the same as last year, and is very considerably lower than the mean of the last 5 years, viz., 0·94.

The cases were most numerous in the third and fourth quarters.

The advent of the autumnal rise was not so abrupt as has usually been the case. The number of cases, arranged in weeks according to the date of onset, shows an increase at the beginning of August, and a larger increase is shown in the week ending September 1st, and is maintained until the middle of November.

The mortality from Enteric Fever in Manchester was 0·14, as compared with 0·13 for the previous year, and with 0·19 for the mean of the previous five years.

With regard to age, the cases were most numerous in the age periods 15-20, 20-25, and 25-35. Very few cases occur among young children. During 1900 there were no cases of Enteric Fever in children under 2 years of age, and only 4 in children under 4 years of age.

The great majority of cases occur in persons over 10 years of age.

The case fatality per cent. of reported cases was 18·0, as compared with 18·1 in the previous year.

After 10 years of age the case mortality shows a progressive increase.

Of the cases notified, 61·4 per cent. were removed to hospital. This is rather lower than the percentage of cases removed in the preceding year, viz., 66·4.

In 1900 there is no evidence that Enteric Fever was conveyed by contaminated water, but there has been an outbreak of Enteric Fever in Manchester and Salford due to contaminated milk, and a few cases where infection has apparently been due to the consumption of shellfish growing in sewage-polluted waters.

There is no case in which it has been ascertained that there is a clear history, or even a strong probability, that infection was due to the consumption of ice-cream.

At page 74 particulars are given of the cases in which a history of infection has been obtained.

It will be noticed what an important part is played by overlooked cases in the spread of the disease.

The diagnosis in all these overlooked cases was verified by the application of the serum test with one exception, and in that case (case 69) there was a post-mortem examination made.

Doubtless there are a large number of mild cases of Enteric Fever which never come under observation at all.

BACTERIOLOGICAL EXAMINATIONS.

Number of cases submitted to examination	Examined outside Hospital		Submitted after admission			Number of negative results in which the Medical Attendant adheres to his diagnosis	Number in which no specimen was taken	Number of others examined	
	Number giving a positive reaction		Number giving a negative result	Number giving a positive reaction					Number giving a negative result
	1st	2nd		1st	2nd				
736	280	2	369	53	0	17	33	31	15

LIST OF CASES TRACED TO DIRECT INFECTION.

Person infected			Source of Infection	Interval of Illnesses	Remarks
Case	Sex and Age	Bact. Reaction			
1	m. 7	+	Slept with sister (case 3), an overlooked case, which gave a + reaction when tested	Sister, onset Dec. 7th. Onset in this case Dec. 19th Interval, 12 days	
6	f. 6	+	Sister nursed at home ...	6 weeks between dates of onset	
12	m. 17	+	Slept in same room and partook of meals with an overlooked case	4 weeks between dates of onset	
{ 19 20	f. 16	+	An overlooked case (32) (infant sister) nursed by both patients, afterwards proved by serum test	29 days between date of onset in case 32 and these cases	3 cases in this house : CASE ONSET 32 (overlooked) ... Dec. 1 19 Dec. 30 20 Dec. 30
	f. 14	+			
{ 29 30	f. 10	+	Slept in same room with overlooked case (28) (+ serum test) for 14 days after onset	14 days	
	f. 17	+			
33	f. 23	+	Mother, overlooked case (serum test +)	15 days	
39	m. 2	+	Living in same house as a case of enteric fever, which this child's mother had been nursing for 7 weeks	7 weeks between dates of onset, but previous case nursed in same house	
42	m. 44	+	Three previous cases in this house	Onsets, 3 weeks, 2 weeks, and 2 weeks, before onset in this case. All 3 removed to hospital 8 days before illness commenced in this case	4 cases in this house : CASE ONSET 28 } removed to { Dec. 30 29 } hospital { Jan. 6 30 } Jan. 13th. { Jan. 6 42 Jan. 21
63	m. 11	+	Slept with brother (case 51)	16 days	
77	f. 40	Incomplete	Nursed case 62	15 days to 5 days	
78	f. 8	—	Slept with sister, who was an overlooked case	6 weeks	
{ 83 84	f. 15	+	Two previous cases here (51 and 63), both + to serum test. Nursed at home. Isolation bad	3 weeks between onsets	See remarks case 90.
	f. 7	+			

LIST OF CASES TRACED TO DIRECT INFECTION IN 1900—*continued.*

Person infected			Source of Infection	Interval of Illnesses	Remarks
Case	Age and Sex	Widal's Reaction			
86	f. 16	+	Brother (case 70) nursed at home for 12 days. (Serum test +)	12 to 24 days	
87	f. 10	+	Nursed sister (case 65). (Incomplete reaction)	4 weeks between dates of onset	
88	f. 26	+	Nursing a case of Enteric in a hospital ward	Was nursing the case when illness commenced	
90	f. 19	Incomplete	4 cases nursed at home, all + Widal's reaction. Isolation bad	First case onset 5 weeks before this, 4th case onset 1 week before this	5 cases in this house : CASE ONSET 51 Jan. 22 63 Jan. 29 84 Feb. 25 83 Feb. 28 90 Mar. 1
94	f. 6	+	Brother (case 72, serum test +) nursed at home	30 days between dates of onset	
96	m. 9	+	Brother (case 58, serum test +) nursed at home 19 days	32 to 51 days	
98	m. 10	+	Case of Enteric (case 69) nursed here 4 weeks, died 32 days before onset in this case. (No serum test)	32 days	4 cases in this house : CASE ONSET 69 { No serum } { test. Inquest } Jan. 17 { and P. M. } 98 Mar. 21 102 Mar. 16 103 Mar. 18
102	m. 7	+	These two patients slept in same bed as case 69 up to the death of that patient	39 days	
103	m. 12	+		41 days	
105	f. 27	+	Nursed case 56 at home. (Serum test +)	44 days between dates of onset	
109	f. 13	+	Two overlooked cases (120 and 124), both + serum test, nursed at home	Onset in overlooked cases March 6 and March 20. In these cases Mar. 30, Apr. 1, and Apr. 4	5 cases in this house : CASE ONSET 124 Mar. 6 120 Mar. 20 110 Mar. 30 109 April 1 111 April 4
110	f. 18	+			
111	f. 39	+			
120	m. 8	+	Overlooked case (120), nursed at home (serum test +)	14 days	

LIST OF CASES TRACED TO DIRECT INFECTION IN 1900—continued.

Person infected			Source of Infection	Interval	Remarks
Case	Sex and Age	Widal's Reaction			
142 147 148 156	f. 29	+	Nursing 2 overlooked cases (147 and 155), both + serum test		5 cases in this house : CASE ONSET 155.....Jan. 27 147.....April 9 142.....April 13 148.....May 2 156.....May 7
	f. 5	+	Infected by overlooked case (155)		
	m. 33	+	” ” ”		
	f. 2	+	” ” ”		
179	m. 14	+	Sister,	30 days	
184 185	f. 7	+	Visited cases of enteric fever, and allowed to play in the sick room on May 27th and June 10th. Onset in these cases June 21st and 22nd respectively	11 days	No clear history of these children having partaken of food in, or from the sickroom.
	f. 3	+		12 days	
186	f. 4	+	Sister of case 179, serum test +	15th day to 5th day before onset	
194	m. 21	Incomplete	Lived at same house as two cases of enteric fever	From 4 weeks before onset	
209	m. 33	Incomplete	Brother of case 201	11 days	
225	f. 10	+	From overlooked case ...	In contact from 32 days before onset	
243	m. 7	None taken	Mother died of enteric fever 13 days before onset in this case		
249	f. 15	+	Infected by overlooked case 248 (serum test +)	In contact from 9 weeks before onset	
255	m. 54	+	Contact with case (103, Armitage Street)		
259	m. 6	+	Overlooked case 265 (serum test +)	From 8 weeks before onset	
270	m. 6	None taken	Son of case 269 (serum test +)	12 days	
279	m. 4	+	Infected by grandmother	Lived in same house 3 weeks after onset	
295	f. 8	+	Brother—overlooked case	In contact from 7 weeks before onset	
300	m. 2½	Doubtful	Brother in same room (serum test +)	From 36 days before onset	

LIST OF CASES TRACED TO DIRECT INFECTION IN 1900—*continued.*

Person infected			Source of Infection	Interval	Remarks
Case	Sex and Age	Widal's Reaction			
316	f. 8	+	Two previous cases, 265 and 259 (serum test +)	12 days	3 cases at this house : CASE ONSET 265 (overlooked) ... July 15 259 Sep. 15 316 Sep. 27
335	f. 18	+	Slept with sister who had enteric (298), serum test +	27th to 9th day before onset	
338	f. 15	+	Father, serum test + (case 262)	27th to 10th day before	
348	f. 10	+	Slept in same room as 361 (serum test +)	From 16 days before onset	
{ 363	m. 11	+	Two previous cases (both + serum test), 338 and 262 Three previous cases, 338, 363, 262	From 21 days before onset	4 cases at this house : CASE ONSET 262 (overlooked) ... Sep. 5 338 Oct. 2 363 Oct. 24 366 Nov. 6
{ 366	f. 9	+			
369	m. 43	+	Father of case 376—an overlooked case, serum test +	4 weeks	
372	f. 9	+	Case of enteric (309), nursed at home	.....
374	f. 17	—	Two cases, 361 and 348, one of which is an overlooked case, nursed at home	From 4 weeks before onset	Dr. in attendance adheres to his diagnosis. 3 cases at this house : CASE ONSET 361 Sept. 30 348 Oct. 19 374 Nov. 24
375	m. 20	+	Two previous cases nursed at home, one of them an overlooked case (376 and 369)	From 4 weeks before onset	
386	m. 33	+	Infected by wife (case 340)	From 17 days before onset	
389	f. 20	+	Father—overlooked case, serum test +	From 3 weeks before onset	
390	m. 16	+	Visiting cases 369, 375, and 376	.....
391	m. 15	+	Three previous cases nursed at home	.....	4 cases at this house : CASE ONSET 376 (overlooked) ... Oct. 9 369 Oct. 24 375 Nov. 23 391 Nov. 27

It will be noticed that there are 3 houses with 5 cases in each, 4 houses with 4 cases in each, and 3 houses with 3 cases in each.

In each instance the large number of cases in each house was due to the fact that the first case was overlooked, no medical man being in attendance, and the illness being looked upon as of minor importance, and being treated with domestic remedies until subsequent cases occurred, when the first case was discovered, and in each instance found to give a positive reaction with Widal's test.

Besides these, there have been 7 other cases where infection has been acquired from an overlooked case, which, when subsequently tested by Widal's test, gave a positive reaction.

There were therefore 62 cases in which there is a history of direct personal contact with a previous case.

There are other cases in which there has been a previous case of illness in the house which may possibly have been Enteric Fever.

Case 93. F. 16.—Slept with her sister, who three weeks previously began to be ill with something which looked very much like Enteric Fever. The blood was not examined owing to the girl refusing to allow a specimen to be taken.

Case 58. M. 16.—Brother had been ill with pneumonia for a month. His illness began January 2nd. This patient began to be ill January 26th. No serum test applied to the brother.

Case 133. M. 16.—Began to be ill March 26th. Notified as suffering from Enteric Fever April 28th. Serum test + This boy's aunt, who lived at the same house, died of pneumonia on April 14th, and some weeks previously the father had a similar illness.

Case 191. M. 37.—There was a case of Enteric Fever in the next house, which used the same privy midden. Six months ago, and nine months previous to that, there were two cases in the next house but one, also a privy midden house.

Case 240. F. 34.—Brother had been suffering from congestion of the lungs. No serum test made.

In November there was an outbreak of Enteric Fever in Salford in connection with a particular milk supply from a dairyman living in Manchester. In the week ending December 1st there were eight cases of Enteric Fever reported in the Regent Road district of Salford, and six of these cases had a common milk supply. The following week (ending December 8th), out of 19 cases reported in the Regent Road district, 12 had this same milk supply.

In the two weeks there were therefore 18 cases of Enteric Fever, all of whom had used this dairyman's milk unboiled.

Although this suspected milk was supplied by a Manchester dairyman, only a small proportion of his milk is sold in Manchester, the greater part going into Salford.

Up to this time there had been no case of Enteric Fever reported in Manchester which was connected with this particular milk supply.

Dr. Tattersall, the Medical Officer of Health for Salford, visited the farms from which the dairyman received his milk, but failed to find any case of illness, or any conditions which were likely to have caused the outbreak.

On December 7th, 1900, the Medical Officer of Health was informed by Dr. Tattersall of the occurrence of these cases in Salford, and proceeded to investigate the conditions at the milkshop.

The following is extracted from his report to the Sanitary Committee :—

On December 8th I ascertained from the Salford Health Office that there had been 15 persons in 10 houses who were suffering from Enteric Fever, all obtaining their milk from Mr. W——, either directly or through an intermediate milk dealer.

No case of Enteric Fever was to be found in our own record using the particular milk supply, but one case of Enteric Fever is reported, beginning on December 7th, in a man aged 23, obtaining his milk from C——, who is supplied by W——. We have ascertained that this man was in the habit of drinking unboiled milk. W——'s milk round is chiefly in Salford.

On December 8th, about noon, I visited the milkshop, and found that Mr. W—— had been ill for seven weeks, and that he had been suffering from what was called Pneumonia, and I entertain no doubt that he has had Pneumonia.

Mrs. W—— informed me that her husband had been ill for seven weeks, that his illness began with shivering, that he had had no pain in the bowels in the course of his illness, but that his breathing had been very bad. She stated that he is not a strong man, and that he has been ailing for two years. She also informed me that he had had no diarrhœa. Meantime the district nurse arrived, and went upstairs to see Mr. W——, and I considered that the circumstances justified me in seeing Mr. W——, who, I was informed, was now convalescent. The nurse, a very intelligent lady, informed me that about three weeks ago the patient had suffered from diarrhœa for some days, and that at that time his motions were pale and clayey. Also that, about the same time, he had a pain across his stomach. She stated that she had been attending him for five weeks, that he had been ill a fortnight when she arrived, that she found him with a high temperature (though unfortunately his temperature chart has been accidentally lost), that he was then rambling at night, and that he continued rambling at night for a fortnight after she began to visit.

She also stated that his temperature was high until about a fortnight ago, but that he is now getting well and feeling stronger every day.

This information roused in me a strong suspicion that he had been suffering from Typhoid Fever, accompanied by Pneumonia.

I communicated this view of the case to his wife, and proceeded to inquire into how contamination, on this supposition, could have occurred.

There were a considerable number of milk cans in the shop, which is not a large one. I examined these, and found them free from dirt. This shop leads into a room which is at once living room and kitchen, and this room opens at the back into a very small yard, having the door of the pail-closet close to the back-door of the room. The yard is badly paved, and contains a sough leading into the yard drain.

All the excreta and washings of the patient have been poured either into the pail or down the sough. Mrs. W—— stated that the cans were always washed in the shop, where there is no provision for washing, and not in the yard, but one of the boys whom I questioned as he came in stated that the cans were sometimes washed in the yard, where there is a water-tap close to the sough. It would be highly inconvenient to wash the cans in the shop.

Mrs. W—— admitted that she attended her husband. She stated, however, that she did not wash the milk cans or handle the milk utensils, and that this was done by the boys. It must be remembered, however,

that enquiries had evidently been already set on foot, as one of the boys who drives the milk cart admitted to me that he knew of cases of illness in the round.

Two boys were employed in driving the milk round, and I thought it necessary to see them. One I saw at the milkshop, and he did not seem in very robust health, which he accounted for by having been out the night before. The other, his brother, was at the stables, and I went there to see him. He looked quite healthy.

It should also be mentioned that Mr. W——'s brother, a farmer, had come to see him. He does not supply his brother with milk. His appearance suggested illness, but he stated that he was subject to rheumatism. It is not likely that he is concerned in the matter.

It was now necessary to consider how best to deal with the occurrence so as to consult at once the reasonable interests of the milkman and the rights of the people supplied by him.

At this moment I met the medical man who has been in attendance on Mr. W——. He strongly repudiated the possibility of Typhoid Fever

Now my experience is that Pneumonia may very readily obscure the presence of Typhoid Fever. It is often present during the disease, and not very rarely ushers it in. This I pointed out, and got his consent to take a specimen of blood from the patient for examination.

The situation appeared as follows :—If Mr. W—— had Typhoid Fever, and was removed to hospital, his premises could be thoroughly disinfected and his business could go on, that is, supposing no farm was implicated.

If Mr. W—— had not got Typhoid Fever, and one of the farms was implicated by Dr. Tattersall, the milk from this farm would be stopped, and the business could go on.

If Typhoid Fever was shown to be present at one of the farms supplying Mr. W——, but any doubt remained as to the nature of Mr. W——'s illness, the business would have to be stopped.

Meantime I had to leave, having previously arranged to return and take specimens from the fingers of Mr. W—— and of the two boys for examination at the College.

The possibility of allowing the business to go on if all the milk were boiled and other precautions taken was considered, but one of the boys coming to the Health Office at 3 p.m. I wrote to Mr. W—— to say that I could not agree to this. It would be impossible to secure this being done.

Later on in the evening I went prepared to take a specimen of blood, but meantime, as Mrs. W—— stated, she had been to see the doctor in attendance, and he had advised her not to allow a sample of blood to be taken. It should be explained that this is a quite insignificant and painless operation. I put the matter very fully before Mr. and Mrs. W——, and warned both of them that they must cease selling milk, but they announced their intention of going on. They said that evidence was wanting that it was their milk that was causing the cases.

In my opinion the evidence was sufficient to require prompt action.

The whole matter was at once laid before the Hospital Sub-Committee.

Subsequently a few cases were reported in Manchester.

Case, Sex, and Age	Date of Notification	Date of Onset	
395. F. 31..	Dec. 13 ...	Dec. 2 ...	Obtained milk from this dairyman
397. F. 29..	Dec. 15 ...	Dec. 6 ...	This patient was confined on Nov. 19, and from that date to Dec. 6 she had regularly milk (unboiled) and soda water
401. M. 15..	Dec. 17 ...	Dec. 5 ...	This patient was in the habit of drinking large quantities of unboiled milk. The other members of the family only took milk in their tea
409. M. 28..	Dec. 28 ...	Nov. 15 ...	This patient had also consumed large quantities of unboiled milk. The rest of the family were said only to take it with tea

The question of stopping the sale of milk from this dairy was settled, by the patient being immediately removed, and the premises being thoroughly disinfected.

The following are the data recorded as to the possible connection between an attack of Enteric Fever and the consumption of shellfish :—

Case 8.—Partook of raw oysters almost daily.

Case 14.—Had a large quantity of mussels 14 days before the onset of Enteric Fever. He had pains in his stomach the night following the day he ate the mussels.

Case 52.—Has been in the habit of eating raw mussels almost every night.

Case 127.—Had some raw oysters 4 days before. He vomited, and felt ill after eating the oysters.

Case 132.—16 days before his illness patient ate some mussels, which had a disagreeable taste.

Case 205.—Has been in the habit of eating raw mussels every Saturday.

Case 309.—Had some mussels, which tasted bad, 17 days before the onset of his illness.

The following three cases had consumed mussels from a particular bed :—

H.L.—commenced to be ill on Dec. 28th, 1899, and was notified as suffering from Enteric Fever. The diagnosis was confirmed by Widal's test. This patient had been in the habit of eating raw oysters and mussels about every other night. The oysters were American; the mussels came from Conway. A letter was sent by the Medical Officer of Health to the dealer at Conway, drawing his attention to the danger probably attending the consumption of these mussels. This patient died on Jan. 6th, 1900.

Case 80.—Began to be ill on Feb. 19th, 1900, and was notified as suffering from Enteric Fever. The blood gave a positive Widal's reaction. Seven days before the onset of illness this patient had consumed mussels which came from the same dealer at Conway. The Medical Officer of Health sent a letter to Dr. Fraser (Medical Officer of Health for Conway), who said, in his reply, "The estuary of the Conway, from which large quantities of mussels are dredged, receives the sewage of Conway, Llandudno Junction, Deganwy, and, considerably lower down, the sewage of Llandudno. Though a large body of fresh and salt water dilutes this sewage, there must be some danger in eating raw mussels from such an estuary." This patient died on March 17th, 1900.

Case 166.—Began to be ill on April 28th, 1900, and his serum gave a positive reaction to Widal's test. Fourteen days before the onset of his illness he had consumed a considerable quantity of raw mussels from the same source as above. It would, therefore, appear that there was a real danger in eating mussels from the above source.

The figures showing the relation of pails, middens, and water-closets to Enteric Fever are as follows :—

PAIL-CLOSETS WITH A URINE GUIDE.

Adjoining the house			Within 4 feet of the house			4 feet or more distant		
Floor dry	Floor wet	Defec-tive	Floor dry	Floor wet	Defec-tive	Floor dry	Floor wet	Defec-tive
104	1	6	20	0	4	74	0	6
111			24			80		

Total, 215.

PAIL-CLOSET WITHOUT A URINE GUIDE.

= 1.

There were two pail-closets situated underneath bedrooms.

MIDDEN CLOSETS.

Adjoining the house			Within 6 feet			6 feet or more distant		
Floor dry	Floor wet	Defec-tive	Floor dry	Floor wet	Defec-tive	Floor dry	Floor wet	Defec-tive
14	0	5	9	0	1	48	0	8
19			10			56		

Total, 85.

WATER-CLOSETS = 83.

Total number of pail-closets = 218, of which only 13 were stated to be defective.

Total number of middens = 85, of which 14 were defective.

The following cases were infected outside Manchester :—

Case	Where Infected				Remarks
5	Hadfield	...	...	...	.....
79	Blackpool	...	...	...	.....
92	Stockport	...	...	...	.....
212	Blackpool	...	...	...	Had eaten some shellfish
223	Do.	...	...	...	Do. do.
229	Morecambe	...	...	...	.....
232	Lytham	...	...	...	.....
237	Morecambe	...	...	...	.....
239	Wigan	...	...	...	.....
243	Germany	...	...	...	.....
282	Blackpool	...	...	...	Had eaten some shellfish
288	?	...	...	...	Traveller
294	Warrington	...	...	...	.....
303	Blackpool	...	...	...	Had eaten some shellfish
314	Wales	...	...	...	.....
330	Aldershot	...	...	...	.....
408	Salford	...	...	...	.....

TYPHUS FEVER.

Towards the end of 1899 an outbreak of Typhus Fever occurred in a rag-sorting establishment. In the course of the outbreak, which lasted to the middle of February, 1901, two distinct foci of the disease were discovered—one in Ancoats, the other in Red Bank. The latter was traced through a series of cases back to the middle of June, and the sinuous and obscure manner in which the disease continued so long is worthy of attention. Like Plague—other than pneumonic—the disease is one with a low infective capacity, except under special favouring conditions. A full report on this outbreak has already been presented to the Council. The points illustrated by the outbreak are these:—

1. The great value of the serum test in excluding Typhoid Fever.
2. The disease was taken now for Pneumonia, now for Enteric Fever, now for Influenza, and again for Scarlet Fever. It is true one of the first cases was seen and diagnosed by me; but, owing to the connected cases being removed to Crumpsall, the trace was lost.
3. The extent to which catarrhal pneumonia was present, and the probability that the disease is spread by the expectoration from such cases. This should cause the greatest vigilance in diagnosing cases of Pneumonia from Typhus.
4. The intimate connection between the business of rag-sorting and the propagation of the disease, no fewer than 4 rag-sorting establishments having been implicated. In 2 of the cases it appeared that the disease had been caused by transference of material from one branch of a rag-sorting firm to another, so that it is not a mere question of infection from person to person.
5. In most of the cases the houses were in a squalid condition, and some of them could not be regarded as fit for human habitation.

The action taken in regard to the cases is given in the report.

6. The disease appeared to have disappeared from Manchester in February, but it is at the time of writing present in Liverpool, and it is to be feared that we shall have a severe struggle to keep it excluded.
7. The total number of ascertained cases was 60, and the number of deaths, most of which occurred in 1901, was 13.

The present depressed condition of trade is eminently favourable to the occurrence of the disease.

Perhaps the chief lesson to be drawn, next to the need for vigilance, is the paramount necessity of enforcing the law as regards keeping houses clean, and removing conditions which render them unfit for habitation.

PLAGUE.

Attention was very sharply directed to this formidable disease by its occurrence in Glasgow during August and September. It appeared not unlikely that it would insidiously introduce itself through one or another port in spite of the excellent Port Sanitary administration which had been built up in recent years. Nevertheless, the isolated cases which had presented themselves had been so promptly dealt with that a feeling of security had been generated. To some extent, perhaps, owing to the absence in the Clyde of the measures of precaution carried out in the large English ports, the disease did, however, effect a temporary lodgment in Glasgow.

The first ascertained case occurred on August 3rd, and the diagnosis of plague was made by the Medical Officers of Belvidere Hospital (Dr. Brownlee and Dr. McClure) with admirable promptitude and decision. No time was then lost by the Medical Officer of Health in taking measures to search out cases, to avert infection by adequate cleansing of infected areas, to segregate contacts, and to protect those in contact with the disease by injections of Yersin's serum and Haffkine's prophylactic, according to circumstances.

I learned of the outbreak early in September, while absent from the City, and at once returned to Manchester. The best course to take in devising protective measures for Manchester appeared to be to visit Glasgow, and see what was being done there. No difficulty was encountered. Indeed the manner in which the Glasgow authorities made their misfortune an opportunity of instruction to other authorities demands an expression of gratitude.

Immediately on my return, what I had learned in Glasgow was put into the form of a circular, which was issued to the practitioners in the City, and which is here reproduced, with slight alterations in the classification of the forms of the disease :—

Public Health Office,

Town Hall, Manchester,

September 10th, 1900.

Dear Sir,—I am instructed by the Chairman of the Sanitary Committee to communicate with you on the subject of the Plague. The occurrence of this disease in Glasgow brings much nearer the possibility of this City

being invaded, and I am to invite you to be on the outlook for suspicious cases, and to ask you, by every means in your power, to assist in preventing the disease effecting a lodgment. You will perhaps excuse me, therefore, if I remind you briefly of the accounts which have been given of this disease. You will find a detailed description in Clifford Allbutt's "System of Medicine," vol. 1, and in articles by Dr. Cantlie and Dr. Lowson in the "Lancet," 1897. An excellent leaflet has also been issued by Dr. Crocker, Medical Officer to the Manchester Port Sanitary Authority.

Generally speaking, the plague resembles typhus fever without the eruption and with the presence of buboes, especially in the groin or axilla. It is more rapid in its progress than typhus fever, and the onset of the stupid and prostrate condition characteristic of that disease is earlier and more striking.

In typical cases the onset is rapid, and the disease is ushered in by severe headache and vertigo, with vomiting and aching of the limbs. The face may be pallid, and has a worn and stupid expression, the eyes are apt to be injected, the speech is thick, the gait staggering, and the patient appears dejected and worn out. The appearance is not unlike that of a man intoxicated, or, as it has otherwise been put, used up for want of sleep.

At the same time, or within a day after these symptoms have set in, the patient has shivering fits, followed by a considerable rise of temperature. The skin is at first dry, the tongue is coated in the centre, and there is excessive thirst.

Within a day or two of the onset of illness buboes form, especially in the groin or axilla, though they may also be found in the neck. In well-marked cases these are painful and very tender, and tend to be surrounded with infiltrated tissue, and to suppurate.

The fever runs a course of variable duration, and falls by crisis, as in typhus fever. Three chief forms may be mentioned.

In the first and most severe form, the whole system is infected (Septicæmic type). These cases may appear stupefied from the beginning, and die in a day or two.

Or the case may begin with severe abdominal pain and diarrhœa, although the symptoms are as above, resembling those of typhus rather than those of enteric fever. These cases have been diagnosed as enteritis and enteric fever (Enteric type).

Such typical cases as the above cannot easily escape detection, especially if a second case occurs. The latent period of the disease is most commonly from three to five days, though it may exceed a week.

The second form is bubonic plague, characterised by painful buboes, high fever, and prostration.

But the disease may assume a milder shape, and in this guise may creep on insidiously without its real nature being at first suspected (*pestis minor*).

Pestis minor is defined as an infectious illness, characterised by glandular swellings, but without severe symptoms, which lasts about a fortnight. There may, however, be only a trifling rise of temperature, disappearing in a day or two. Such cases have been diagnosed as mumps.

Of the same character are the cases of *pestis ambulans*, which occur during severe epidemics.

Intermediate between these two varieties of bubonic plague are others in which there is a sharp onset of illness, with considerable anxiety, fever, and swelling of one or more glands, though the illness is at no time very dangerous.

The type of disease may, however, vary from *pestis minor* to that of the most severe form of bubonic plague.

A third form is that of pneumonic plague, in which the incidence falls especially on the lungs. The general symptoms are those already described, but the signs are those of pneumonia. In such cases it is stated that the breathing is not rapid disproportionately to the pulse, while the discharge from the lungs is thin and pale red, and contains abundance of plague bacilli. The pneumonia inclines to be rather lobular than lobar. There may be no expectoration.

It is desirable, at the present time, to pay special attention to any sudden illness accompanied or followed by enlarged glands in the neck, axilla, or groin, or in all these situations. It is not necessary that the enlargement should be great to constitute the case one of *pestis minor*.

Having seen the Glasgow cases, I am anxious to communicate the impression made on me: how easily the slighter forms may escape attention unless specially looked for, and how the disease may thus be ramifying for some time in a large town before it is suspected.

In any case in which your suspicions are aroused I shall be pleased to give you any assistance in my power.

Rats and mice are especially liable to be attacked at an early period, and have been instrumental in spreading plague. The occurrence of dead rats or mice under circumstances in which they must have perished from disease should arouse suspicion, and will help you to form a probable conclusion in regard to cases coming under your notice. The nature of the disease in these animals can be ascertained by bacteriological examination after death.

Should it happen that any case under your charge appears to be one of plague, the following procedures should be adopted :—

The patient should at once be isolated and placed in charge of a special nurse, and the case should be at once reported to the Medical Officer of Health. The Medical Officer of Health, or one of the Assistant Medical Officers, will then call and see the case, and, if necessary, will take a sample of blood for bacteriological examination.

The nature of the disease having been sufficiently ascertained, the patient would be at once removed to hospital.

The house would be thoroughly disinfected, and all articles which could have become contaminated, and which had not been disinfected at home, would be removed for disinfection to the Corporation station.

As it may not be always possible at once to get a suspicious case removed, the following precautions should be taken pending confirmation and removal :—

The patient should be stripped and thoroughly cleansed, his clothing being placed in a disinfecting solution, and the bedroom should be cleansed in every part. The patient having been, where possible, provided with clean warm bedclothes, or, at all events, clean sheets, the window should be kept open. A special effort should be made to destroy insects in the house, such as fleas and bugs, for which purpose the surfaces may be washed with a 10 per cent. solution of carbolic acid.

All discharges from the patient (fæces, urine, sputum, nasal discharges, mouth wipings, vomit, and discharges from buboes) should be at once placed in a strong disinfectant, preferably an acid solution of perchloride of mercury (1 in 1,000), infected clothing being similarly treated.

The greatest care should be exercised to prevent any discharges from the patient contaminating any article in the room or the atmosphere.

If these precautions are carried out effectually, there will be little danger of infection from the patient after the illness is recognised.

All persons in contact with the patient before the recognition of his illness and his removal to hospital should be carefully examined to see whether there were any cuts or breaks of the surfaces of skin or mucous membrane which could have admitted infection, and any such should be treated with antiseptics. It would be necessary to keep all "contacts" under medical observation for at least 10 days.

According to Lowson, the infection is introduced into the system by respiration, inoculation, or swallowing. Hence, in the presence of the disease, the chief safeguard is to prevent the distribution of infectious dust by disinfecting all infected surfaces with a liquid disinfectant, especially the floor, disinfecting other articles by steam or boiling, and subsequently maintaining strict cleanliness. It is also necessary to guard against infection by unprotected sores and cuts, and by bites of insects, All food (even bread) should be well cooked before use.

In conclusion, it is desirable to emphasize the possibility, suggested by previous occurrences, that the plague may find admission as a slight or misleading form of illness, and so creep on insidiously before assuming its most formidable characters.

I am, dear Sir,

Yours faithfully,

MEDICAL OFFICER OF HEALTH.

Several doses of Yersin's serum were procured, and arrangements were made for immediately obtaining material from suspected cases, should they arise. Clayton Hospital was available for the reception of the first cases.

Yersin's serum and Haffkine's prophylactic are both available for prevention, either in combination or separately, according to circumstances.

The other procedures intended to be pursued were much the same as those carried out in Glasgow, and subsequently applied to the small outbreak of typhus occurring at the end of the year 1900 and the beginning of 1901.

There is indeed a remarkable parallelism between these diseases. They are both liable to creep on insidiously for a considerable time under the guise of more familiar conditions. It was discovered that typhus had been creeping about in Manchester for six months before it assumed a definite shape in December. The symptoms are much alike, as, apart from the signs of the disease, both are intimately associated with pneumonia; both are intimately associated with filth and misery; and both are arrested by much the same course of prevention.

On September 17th I communicated to the Hospital Sub-Committee a report on the disease, which, however, I do not reproduce on account of its length. The points of chief interest may be briefly summarised as follows :—

The discovery, independently, by Yersin and Kitasato of the plague bacillus in 1894 enormously facilitates the diagnosis of the disease, and gives precision to preventive action.

Plague has for a number of years been extending, till in 1899 it was established in India, Mongolia, Arabia, China, Portugal, Madagascar, the Mauritius, Reunion, German East Africa, Portugese East Africa, and Brazil. In 1900 it invaded the Southern States of America, and Australia; while in the present year it has invaded the Cape Colony.

With our immense commerce, we are thus vulnerable from many points, and must rely chiefly on the efficiency of our Port Sanitary administration for protection.

Plague is liable to be introduced into a new locality chiefly either by overlooked cases or by infected rats. Mice are also very susceptible, but are not so likely to spread the disease. Hence the vermin on board an infected ship require special attention, and, if possible, destruction. In an invaded locality it becomes of prime moment to destroy the rats at an early period.

In all cases the sputum, when procurable, should be examined, as in plague pneumonia the sputum is highly charged with plague bacilli. The destruction of sputum in such cases is, therefore, of the greatest moment.

It is probable that the disease is spread by insects, and the greatest care is therefore necessary in dealing with plague cases, which otherwise with suitable precautions are little liable to infect, except in the form of pneumonia.

In my opinion, with the present prevalence of plague, the enormous number of rats in Manchester forms a menace to the public safety. Defective drains should be very actively made good, and the rats should be destroyed.

On a consideration of the report alluded to above, the Hospital Sub-Committee passed the following resolutions, which express sufficiently the points on which the Committee placed stress :—

Hospitals Sub-Committee,

17th September, 1900.

Resolved.—That should a case of Plague occur in the City, the Chairman of the Hospitals Sub-Committee and the Medical Officer of Health be empowered to take immediate steps to seek out suspicious cases, and to cleanse any limited infected quarter, and to take such other action as they may consider necessary.

Resolved.—That, under the direction of the Chairman of the Hospitals Sub-Committee, the Medical Officer of Health be instructed to prepare and issue a circular to the managers of common lodging-houses and houses let in lodgings, giving directions as to cases which should be regarded as suspicious, and as to the necessity of rigorous cleanliness.

Resolved.—That it be recommended to the Council to add Plague to the list of notifiable infectious diseases.

Resolved.—That powers be obtained to enforce the segregation of contacts on the outbreak of any dangerous infectious disease.

Resolved.—That the report of the Medical Officer of Health in relation to Plague be printed, and that a copy thereof be forwarded to each member of the Sanitary Committee.

To this it may be well to add that, in view of the threatening aspect of plague, of the presence of typhus in the beginning of the year, and of its continuance in Liverpool at the present time, I consider that the requirements of the Public Health Act in regard to the cleansing of dirty houses need to be more stringently enforced.

In averting plague, typhus, tuberculosis, diarrhoea, all most destructive diseases, the all-important procedure is to enforce cleanliness, as scientifically interpreted. The discoveries of bacteriological science add additional emphasis to this proposition.

In the case of plague, the instance of Bombay sufficiently demonstrated that not overcrowding, not deficient light, not defective ventilation even, though all of them important, but filth and squalor are the conditions to be most dreaded. This is amply corroborated by the history of plague on the shores of the Red Sea, and in German East Africa.

Cleansing under wise regulations is the most essential part of sanitary prevention.

As regards plague in particular, our chief defence must always lie with our Port Sanitary Authorities. The Local Government Board have bestowed great care on this portion of our local administration.

They have issued the most precise directions as to how an infected vessel or a vessel hailing from an infected port is to be dealt with, and as to the action to be pursued in regard of passengers suspected to be suffering from plague, of persons on board an infected ship, or of passengers found to be in a filthy or unwholesome condition.

It is, however, a difficulty that the address given by passengers as their intended place of destination is not infrequently incorrect.

They have not dealt with the destruction of vermin on board ship, or with the precise measures of disinfection to be pursued, nor does there appear any reason why they should.

The former comes under the precautions deemed necessary by the Medical Officer of Health, and the necessary disinfection is in a constant state of flux, according as strict scientific ideas, or, what is often of as much importance, a practicable course of action, prevails with the Medical Officer of Health.

Efficiency is a result determined by scientific data, but with discriminations.

Plague is at present constituted by the Local Government Board a notifiable disease, and all cases notified to the Sanitary Authority must be at once notified to the Local Government Board.

MEASLES.

The following are the rates of mortality for 1900, compared with the mean of the previous five years:—

1900—MEASLES MORTALITY.—RATE PER 1000 LIVING, COMPARED WITH MEAN OF FIVE YEARS.

	1895	1896	1897	1898	1899	Mean	1900
England and Wales	0·37	0·56	0·40	0·41	0·31	0·41	0·39
33 Great Towns	0·53	0·71	0·55	0·56	0·46	0·56	0·43
London	0·60	0·82	0·43	0·69	0·47	0·60	0·42
City of Manchester ...	0·96	1·05	1·17	0·50	1·28	0·99	0·47
Manchester Township ...	0·94	1·89	1·69	0·48	2·35	1·47	0·37
North Manchester	0·70	1·01	0·63	0·56	1·22	0·82	0·53
South Manchester	1·11	0·57	1·18	0·48	0·71	0·81	0·48
67 Smaller Towns	0·38	0·64	0·43	0·41	0·28	0·43	0·51
Rural Districts	0·26	0·43	0·29	0·31	0·21	0·30	0·32

The deaths from Measles in districts are as follows:—

1900—DEATHS AND DEATH-RATE FROM MEASLES IN THE VARIOUS DIVISIONS OF THE CITY.

Statistical Divisions		Estimated Population	Deaths	Death-rate
City of Manchester		542,566	254	0·47
I. Manchester Township ...		136,260	50	0·37
II. North Manchester.....		159,709	85	0·53
III. South Manchester.....		246,597	119	0·48
I.	Ancoats	45,224	6	0·13
	Central	31,194	9	0·29
	St. George's	59,842	35	0·58
II.	Cheetham	37,371	3	0·08
	Crumpsall	8,512	1	0·12
	Blackley.....	8,908	1	0·11
	Harpurhey	14,884	6	0·40
	Moston	11,239	5	0·44
	Newton Heath	36,496	16	0·44
	Bradford	23,297	37	1·59
	Beswick	11,442	10	0·87
III.	Clayton	7,560	6	0·79
	Ardwick	40,766	23	0·56
	Openshaw	26,841	23	0·86
	Gorton (West)	27,442	8	0·29
	Rusholme and Kirk.....	25,221	2	0·08
	Chorlton-upon-Medlock..	58,476	11	0·19
	Hulme	67,851	52	0·77

1900—MEASLES.—DEATHS IN QUARTERS IN THE CITY AND IN
GROUPS OF DISTRICTS.

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
City of Manchester	82	95	53	24
Manchester Township ...	16	27	4	3
North Manchester	20	32	20	13
South Manchester	46	36	29	8

WHOOPING COUGH.

The tables relating to this disease show that the death-rate in Manchester for 1900 was decidedly above the average for the preceding five years, and it exceeded the death-rate for England and Wales by 0·34 per 1,000 living.

The rates giving the Whooping Cough mortality for 1900 are as follows :—

1900.—WHOOPING COUGH MORTALITY.—RATE PER 1000 LIVING, COMPARED
WITH MEAN OF FIVE YEARS.

	1895	1896	1897	1898	1899	Mean	1900
England and Wales	0·30	0·41	0·35	0·31	0·30	0·33	0·34
33 Great Towns	0·37	0·57	0·41	0·42	0·38	0·43	0·45
London	0·34	0·65	0·41	0·48	0·38	0·45	0·43
City of Manchester...	0·47	0·66	0·56	0·31	0·42	0·48	0·68
Manchester Township ...	0·72	0·92	0·68	0·41	0·41	0·63	0·79
North Manchester	0·37	0·50	0·29	0·14	0·50	0·36	0·66
South Manchester.....	0·38	0·60	0·64	0·36	0·37	0·47	0·64
67 Smaller Towns.....	0·32	0·43	0·38	0·27	0·32	0·34	0·34
Rural Districts	0·25	0·30	0·31	0·25	0·25	0·27	0·27

The following are the deaths in quarters, which shows that the disease was most prevalent in the first half of the year :—

1900.—WHOOPING COUGH.—DEATHS IN QUARTERS IN THE CITY, AND IN GROUPS AND DISTRICTS.

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
City of Manchester	118	159	63	31
Manchester Township ...	34	55	11	8
North Manchester	42	35	20	8
South Manchester	42	69	32	15

The following table shows the districts most affected :—

1900.—DEATHS AND DEATH-RATES FROM WHOOPING COUGH IN THE VARIOUS DIVISIONS OF THE CITY.

Statistical Divisions		Estimated Population	Deaths	Death-rates
City of Manchester		542,566	371	0.68
I. Manchester Township.....		136,260	108	0.79
II. North Manchester		159,709	105	0.66
III. South Manchester		246,597	158	0.64
I.	Ancoats	45,224	29	0.64
	Central... ..	31,194	22	0.71
	St. George's.....	59,842	57	0.95
II.	Cheetham	37,371	23	0.62
	Crumpsall	8,512	10	1.18
	Blackley... ..	8,908	5	0.56
	Harpurhey	14,884	6	0.40
	Moston	11,239	6	0.53
	Newton Heath	36,496	27	0.74
	Bradford	23,297	11	0.47
	Beswick	11,442	9	0.79
	Clayton	7,560	8	1.06
III.	Ardwick	40,766	33	0.81
	Openshaw	26,841	18	0.67
	Gorton (West).....	27,442	32	1.17
	Rusholme and Kirk.	25,221	6	0.24
	Chorlton-upon-Medlock.....	58,476	28	0.48
	Hulme.....	67,851	41	0.60

In the year 1899 the death-rate from Measles reached the very high figure of 1·28 per 1000. It so happened that in that year the central part of the City was chiefly affected, a circumstance which, of itself, favours a high death-rate, inasmuch as the fatality amongst the poor children in the heart of Manchester is always much greater than the fatality in North or South Manchester from the same diseases.

No schools have been closed since the beginning of 1900, except one or two voluntarily. It has been put forward that the temporary diminution of the Measles mortality when schools ceased to be closed proved that the closing of schools does more harm than good. It is sufficient to point out that amongst the towns most severely visited by Measles were Preston and Salford, in which the policy of closing schools was not adopted.

The question is, however, a complicated one, and cannot be re-discussed in an annual report without a further report being placed before the Sanitary Committee.

For the year 1900 the mortality from Measles was lower than in any year since 1894. This year the Manchester Township was the least heavily visited of the three divisions of the City, a fact which goes some way to explain the exceptionally low mortality during the year, although in each of the three divisions of the City the death-rate is lower than it was in 1899. The death-rate is heaviest in the first quarter, and diminishes towards the end of the year. In 1900 the mortality was heaviest in Bradford, Beswick, Openshaw, Clayton, and Hulme. In 1899 also Bradford and Beswick were severely visited, so that these two districts will justify special study.

The procedures described in previous Annual Reports have been carried on during the year, and have doubtless imposed some hindrance to the propagation of the disease.

From Whooping Cough, on the other hand, the mortality has considerably increased, the death-rate being higher than in any recent year. The relations of this disease to schools are very similar to those of Measles, and the schools in which a high proportion of the infants were affected with either disease are, therefore, given in one table. The death-rate is highest in the second quarter of the year, and diminishes towards the end of the year.

This preponderance of mortality in the second quarter of the year will be seen, on referring to previous Annual Reports, to be of regular occurrence. Hence, if special measures were to be taken to prevent the spread of Whooping Cough, March, April, and May would be the months in which such measures would be put into operation. The disease was more fatal in the Manchester Township than in North or South Manchester. The highest individual death-rates from Whooping Cough were experienced in Crumpsall, West Gorton, and Clayton, then in St. George's.

The following table shows schools in which the percentage of children in the infant departments of schools exceeded 10 at any one time during the year 1900.

NUMBER AND PERCENTAGE OVER 10 OF SCHOLARS ABSENT FROM THE INFANT DEPARTMENTS OF SCHOOLS SUFFERING
FROM MEASLES AND WHOOPING COUGH DURING 1900.

Date	School	Department	Average Attendance	Present Attendance	Measles	Whooping Cough	Percentage
March 14	Armitage Street Board	Infant	246	219	32	...	13
" 27	"	"	246	222	33	...	13
April 3	"	"	246	230	28	...	11
" 9	Ashton Old Road Board	"	283	276	33	...	12
" 24	"	"	280	252	36	...	12
May 8	"	"	278	283	36	...	13
November 22	Bank Meadow Board	"	256	244	35	...	14
December 1	"	"	254	232	37	...	15
" 19	"	"	258	222	50	...	16
January 23	Clarendon Road Board	"	145	110	...	30	21
July 4	Ducie Avenue Board	"	140	121	...	26	19
March 3	Duke Street Board	"	226	207	33	...	15
" 27	"	"	226	213	24	...	11
May 8	Holland Street Board	"	99	99	...	12	12
" 30	"	"	99	103	...	12	12
September 7	Oldham Road Board	"	99	99	13	...	13
" 22	"	"	92	69	33	...	36
June 27	Queen Street Board	"	236	215	82	...	31
July 2	"	"	164	164	35	...	21
September 7	"	"	196	254	37	...	19
April 3	St. George's Board	"	172	178	...	19	11
May 30	St. Matthew's Board	"	121	114	15	...	12
June 27	"	"	121	128	18	...	15
March 10	Smedley Road Board	"	126	137	...	14	11
May 21	Ten Acre Lane Board	"	108	114	12	...	11
October 29	"	"	95	80	12	...	13
November 22	"	"	92	78	14	...	15
June 4	Tuer Street Board	"	158	141	18	...	11
" 19	"	"	155	130	17	...	11
" 27	Varna Street Board	"	445	470	50	...	11

NUMBER AND PERCENTAGE OVER 10 OF SCHOLARS ABSENT, ETC.—continued.

Date	School	Department	Average Attendance	Present Attendance	Measles	Whooping Cough	Percentage
April 3	Vine Street Board	Infant	187	179	21	...	11
May 12	All Saints' Church of England, Chorlton-on-Medlock	"	86	92	...	10	12
October 12	" " Newton	"	130	99	45	...	35
" 26	" " "	"	130	88	62	...	48
February 5	Cathedral Church of England	"	178	129	...	23	13
August 17	Christ Church of England, Beswick	"	340	281	60	...	18
November 7	" " "	"	340	269	46	...	14
May 18	St. Andrew's Church of England, Baird Street	"	133	120	...	16	12
June 11	St. Ann's Church of England	"	127	131	...	23	18
September 5	" " "	"	150	144	...	29	19
" 13	" " "	"	130	172	...	25	19
June 25	St. Barnabas' Church of England	"	283	199	97	...	34
August 31	St. Clement's Church of England, Openshaw	"	192	180	34	...	18
April 28	" " Gorton West	"	175	164	23	...	13
May 5	" " "	"	175	169	24	...	14
" 26	" " "	"	196	176	26	...	13
March 27	St. George's Church of England	"	148	170	20	...	14
February 16	" " (Branch)	"	123	67	44	...	36
" 26	" " "	"	123	88	46	...	37
March 14	" " "	"	123	108	27	...	22
July 10	" " "	"	135	147	17	...	13
March 14	St. John the Baptist Church of England	"	104	88	...	15	14
" 23	" " "	"	121	93	...	16	13
" 31	" " "	"	118	98	...	18	17
May 1	St. John's Church of England, Deansgate	"	110	94	15	...	13
" 18	" " "	"	115	96	20	...	17
June 23	" " "	"	130	65	50	...	38
July 10	" " "	"	130	80	38	...	29
May 19	St. Mark's Church of England, Gorton West	"	209	180	...	28	13
" 21	St. Mark's Church of England, Newton	"	196	180	...	26	13
October 22	St. Thomas's Church of England	"	308	290	40	...	13
March 23	St. Wilfrid's Church of England	"	130	122	15	...	12

NUMBER AND PERCENTAGE OVER 10 OF SCHOLARS ABSENT, ETC.—*continued.*

Date	School	Department	Average Attendance	Present Attendance	Measles	Whooping Cough	Percentage
May 22	Corpus Christi Roman Catholic	Infant	226	194	...	31	14
" 28	St. Bridget's Roman Catholic	"	202	194	21	...	10
July 5	"	"	200	189	33	...	17
May 29	St. Francis' Roman Catholic	"	291	249	64	...	22
February 24	St. Lawrence's Roman Catholic	"	81	54	21	...	26
April 28	St. Wilfrid's Roman Catholic	"	240	256	29	...	12
" 28	"	"	240	256	...	54	23
May 10	"	"	240	257	...	50	21
" 19	"	"	240	270	...	63	26
" 5	Culcheth British	"	114	91	...	16	14
December 7	Moston British	"	90	83	...	12	13
February 7	Blackley Wesleyan	"	78	69	...	14	18
March 24	Collyhurst Wesleyan	"	132	111	...	30	23
" 31	"	"	132	101	...	33	25
April 7	"	"	132	75	...	40	30
" 24	"	"	132	75	...	42	32
February 21	Openshaw Wesleyan	"	160	108	40	...	25
" 24	"	"	160	108	44	...	28
March 14	"	"	128	127	17	...	13
July 10	"	"	152	168	...	26	17
April 3	Dean Lane Board	Mixed	263	253	28	...	11
" 19	"	"	262	230	53	...	20

SUMMER DIARRHŒA.

On the 30th June, 1900, the four-foot thermometer stood at 56°·0, the critical point at which Dr. Ballard has shown that Summer Diarrhœa assumes a prevalent character. The thermometer continued to rise until, on the 4th of August, it stood at 60°·6 From August 25th a fall set in, and on September 30th it stood at 57°·0.

The following are the registered deaths from Diarrhœa and Simple Cholera in weeks during the third quarter of the year :—

July 7th	6
„ 14th.....	7
„ 21st	11
„ 28th.....	19
Aug. 4th	37
„ 11th.....	63
„ 18th.....	50
„ 25th.....	50
Sept. 1st	83
„ 8th	78
„ 15th.....	64
„ 22nd	36
„ 29th.....	58
	<hr/>
	562
	<hr/>

The numbers of deaths in quarters are as follows :—

DIARRHŒA AND SIMPLE CHOLERA DEATHS IN QUARTERS 1891-1900.

	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900
First Quarter...	45	32	48	47	51	37	49	55	46	41
Second Quarter	64	36	131	55	59	78	50	49	53	66
Third Quarter..	217	275	688	212	574	391	803	807	948	562
Fourth Quarter	106	75	89	61	220	66	62	179	74	153
	432	418	956	375	904	572	964	1090	1121	822

By means of the following table we are enabled to observe the comparative degree of severity with which different districts of the City have been visited. It should be compared with the corresponding tables in recent reports :—

1900.—DEATHS AND DEATH-RATES FROM DIARRHŒA AND SIMPLE CHOLERA
IN THE VARIOUS DIVISIONS OF THE CITY.

STATISTICAL DIVISIONS		Estimated Population	Deaths	Death- rates	Deaths under 1 year per 1000 Births
City of Manchester		542,566	822	1·52	35·64
I. Manchester Township		136,260	289	2·12	47·50
II. Northern Districts		159,709	176	1·10	24·38
III. Southern Districts		246,597	357	1·45	36·10
I.	Ancoats	45,224	117	2·59	48·56
	Central	31,194	60	1·92	54·99
	St. George's	59,842	112	1·87	43·37
II.	Cheetham	37,371	29	0·78	17·96
	Crumpsall	8,512	3	0·35	14·56
	Blackley	8,908	2	0·22	4·41
	Harpurhey	14,884	7	0·47	11·32
	Moston	11,239	3	0·27	2·80
	Newton Heath	36,496	39	1·07	25·42
	Bradford	23,297	55	2·36	43·33
	Beswick	11,442	24	2·10	40·63
	Clayton	7,560	14	1·85	36·36
III.	Ardwick	40,766	82	2·01	43·66
	Openshaw	26,841	48	1·79	44·65
	West Gorton	27,442	65	2·37	52·58
	Rusholme and Kirk	25,221	15	0·59	15·43
	Chorlton-upon-Medlock ...	58,476	47	0·80	25·12
	Hulme	67,851	100	1·47	33·10

By means of the following rates we are enabled to compare the fatality from Diarrhoea and Simple Cholera in Manchester with that prevailing in other parts of the country:—

1900.—DIARRHOEA AND SIMPLE CHOLERA MORTALITY.—RATE PER 1,000 LIVING, COMPARED WITH MEAN OF FIVE YEARS.

	1895	1896	1897	1898	1899	Mean	1900
England and Wales	0·88	0·55	0·86	0·96	0·98	0·85	0·69
33 Great Towns	1·19	0·79	1·24	1·22	1·21	1·13	0·94
London ..	0·82	0·72	0·92	0·97	0·93	0·87	0·78
City of Manchester	1·72	1·06	1·79	2·01	2·05	1·71	1·52
Manchester Township	2·22	1·44	2·35	2·66	2·60	2·25	2·12
North Manchester	1·38	0·80	1·50	1·66	2·00	1·47	1·10
South Manchester	1·60	0·98	1·65	1·85	1·78	1·55	1·45
67 Smaller Towns	1·13	0·68	1·05	1·09	1·22	1·03	0·81
Rural Districts	0·64	0·36	0·56	0·75	0·76	0·61	0·48

The following table supplies meteorological data for the third quarter of the year, the season in which the disease is most prevalent:—

Third Quarter of the years	Mean Temperature	Rainfall, Inches	Humidity, per cent.	Diarrhoea and Simple Cholera Mortality. Annual Rate per 1,000 living
1887	59°·0	7·7	73 %	3·38
1888	56°·5	11·2	77 %	1·36
1889	57°·7	10·5	73 %	2·61
1890	58°·8	8·1	74 %	2·28
1891	58°·2	12·8	79 %	1·57
1892	57°·0	12·5	78 %	2·07
1893	60°·4	10·7	74 %	4·95
1894	57°·8	9·0	78 %	1·55
1895	60°·4	11·2	77 %	4·17
1896	58°·5	9·7	76 %	2·93
1897	58°·9	9·7	73 %	6·01
1898	60°·1	6·1	74 %	6·00
1899	60°·8	7·7	75 %	6·96
Mean	58°·8	9·8	75 %	3·53
1900	60°·3	9·6	78 %	4·14

The death-rate from this disease reached the high figure of 1·52 per 1,000 of the population. The number of deaths under 1 year per 1,000 births was 35·64, or nearly one-fifth of the entire infantile mortality.

The deaths from Diarrhoea last year were more spread out than usual, being in excess of the mean both in the 2nd and 4th quarters of the year.

Nevertheless, the annual death-rate, though very high, was below that of the previous five years.

The mean death-rate throughout England and Wales during the years 1895 to 1899 was 0·85 per 1,000, in the City of Manchester 1·71 per 1,000, or almost exactly double.

The death-rate in 1900 was above 2 per 1,000 of the population in the following districts, beginning with those having the highest death-rate: Ancoats, West Gorton, Bradford, and Beswick. The following districts, in descending order of fatality, had an infantile death-rate of over 40 per 1,000: Central, West Gorton, Ancoats, Openshaw, Ardwick, St. George's, Bradford, and Beswick.

The outstanding facts about fatal Summer Diarrhoea are that it attacks a small proportion of breast-fed as compared with artificially-fed infants, and that it is found to occur largely in association with dirty homes and maternal neglect. There can be no doubt, then, that it is due to material introduced into the body by the food of the infant. If, however, breast-fed infants escape, why do any breast-fed infants suffer. This is probably owing in part to the fact that the infant is occasionally indulged with other food besides the mother's milk, and partly that the infant is allowed to suck dirty fingers and clothes.

We should certainly expect, the disease being one affecting the bowels and causing Diarrhoea, to find a high proportion of infections occurring at home. Such is not the case, although this may partly be owing to the absence of infants susceptible of infection, and it is necessary not to be too absolute about an inference. Again, the disease is unquestionably due to matter swallowed, whether in the food or otherwise. I have heard it maintained that it is due to the high temperature of the air chiefly, and not to ingested matters, and possibly the system may in the warm season be more susceptible. But that it is due to ingested matters is shown by the comparatively small proportion of breast-fed children attacked.

Then, again, if it is due to a bacillus introduced in the food, if we did not go so far as to expect a large proportion of infections at home, we should expect that it would stand in close relation with the proximity to the house of pails and middens. We have seen in former Reports that the relation is not a close one, and indeed it would be difficult to sustain such a relationship in face of the low mortalities experienced in Rusholme, Blackley, Harpurhey, and Moston.

That the causes of the disease are to be sought for in persistent conditions of the districts is clearly shown by the continuous high death-rates in such districts as Bradford and West Gorton.

For the present we must be content to rest on the knowledge that the disease is due to contaminated food, and that the food is contaminated owing to the carelessness and neglect of parents.

I have written to Mr. Wyatt, in accordance with the wish of the Sanitary Committee, proposing that the School Board shall undertake the instruction of girls in the end of May or the beginning of June, giving instructions in the necessary precautions to be taken.

Instructions in the precautions to be taken have also been issued to every house in the City, through the kind offices of the Watch Committee.

The relations of the dates of attack of fatal cases of Summer Diarrhœa are shown on the accompanying chart, prepared by Dr. McCleary.

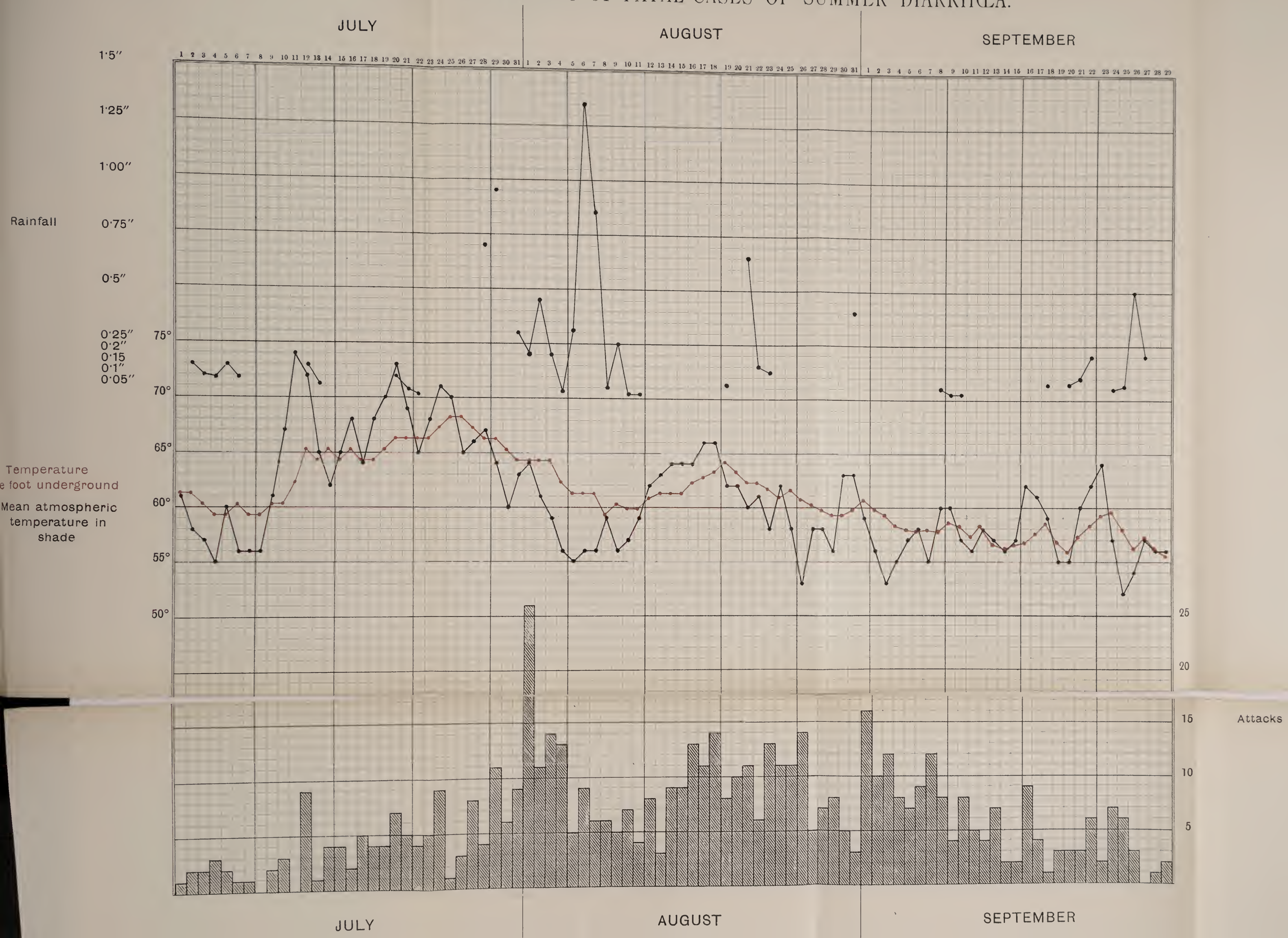
The fatal cases began to be more numerous on July 11th, and may be grouped as follows:—An increase of cases from July 11th to July 23rd. A diminution from July 24th to July 28th. A great increase from July 29th to August 4th. A marked decrease from August 5th to August 13th. A steady increased incidence from August 14th to August 25th. A diminution from August 26th to August 31st. An increased incidence from September 1st to September 8th, and then a gradual diminution.

The first sharp onset takes place on July 12th, five days after the last slight rainfall, with a steadily rising thermometer, but is to some extent set back by a slight rainfall on July 12th and 13th. On July 20th, 21st, and 22nd there is slight rainfall, which produces a slight drop in the temperature of the air, and is accompanied by a diminution in the number of cases from July 24th to July 28th.

From the 22nd to the 27th no rain occurs. On the 27th there is a heavy fall of rain, and again on the 29th, which causes a marked fall in temperature. Nevertheless, the increase in the number of cases takes place from July 29th to August 4th. The fall of temperature is very much accentuated by a heavy rainfall on July 31st to August 9th, and this is accompanied by a marked decrease in the number of cases, beginning about August 5th. There is then continuous drought almost up to August 21st. The temperature begins to ascend on August 9th, and the cases definitely to increase on August 14th, the increase being more marked on August 16th.

1900.

DATES OF ATTACKS OF FATAL CASES OF SUMMER DIARRHŒA.



Another rainfall occurs on August 21st, 22nd, and 23rd, leading to a temporary fall of temperature. This stands in connection with the diminution of cases from August 26th to August 31st, the effective influence being felt on August 21st, and the maximum effect on August 30th and 31st.

No rain then falls till August 30th, giving a week of dry weather. The temperature of the air rises on August 27th, and sharply on August 30th. The final increase in the number of cases begins on September 1st.

It would thus seem that the influences affecting the occurrence of fatal cases of Summer Diarrhoea act quickly, and probably through changes effected in the surface layers of the soil. This was the conclusion to which the charts given for the year 1899 also pointed. (*See Charts.*)

NOTIFICATION OF PHTHISIS.

Dr. Coates has prepared a return on the work done under this scheme. His report deals almost entirely with the clinical evidence of infection. An outline was given in the Report for 1899 of the administrative arrangements, and it has not been deemed necessary to deal with the subject this year.

Special attention is drawn to the great amount of infection in workshops. There can be no doubt that a reform is greatly needed in respect of these. In my opinion, spitting in any confined place should be defined as a nuisance, and punished, as in New York. Moreover, the floors of workshops should be required by law to be cleansed periodically with a suitable disinfectant, such as solution of chlorinated lime.

I would also draw attention to the large number of dirty houses mentioned in the Report. From the very nature of Phthisis, its propagation is dependent on dirty habits and conditions. We have this year considered three very fatal diseases, all preventable chiefly by the practice of cleanliness, viz. : Plague, Typhus, and Phthisis.

ANALYSIS OF WORK DONE UNDER THE NOTIFICATION OF PHTHISIS, PREPARED BY DR. HAROLD COATES.*

During the year 1900, 1,573 fresh cases of Phthisis were notified to the Medical Officer of Health.

Of these notifications, 587 were notified from the Union Hospitals, or by the Poor-Law Union District Medical Officers; and 446 cases were notified from the various hospitals and dispensaries in the city not connected with the poor-law administration.

* A report prepared by Dr. McCleary is incorporated for economy of space; but justice should be done to the admirable manner in which Dr. McCleary carried out this work.

Until February, 1900, notifications had only been invited from public institutions; but on February 3rd, 1900, private medical practitioners were invited to notify cases in their practice, and 540 cases of Phthisis were notified by private medical practitioners from February 3rd to December 31st, 1900.

The following table shows the distribution in districts of the cases notified during the year 1900 :—

	CASES NOTIFIED	DEATHS REGIS- TERED
City of Manchester	1573	1135
I. Manchester Township	635	479
II. North Manchester.....	283	211
III. South Manchester.....	655	445
I. { Ancoats	150	130
{ Central	164	140
{ St. George's	321	209
II. { Cheetham	72	44
{ Crumpsall	9	8
{ Blackley.....	13	8
{ Harpurhey.....	10	23
{ Moston	17	9
{ Newton	94	57
{ Bradford	36	29
{ Beswick	21	24
{ Clayton	11	9
III. { Ardwick.....	80	65
{ Openshaw	34	32
{ West Gorton.....	74	41
{ Rusholme and Kirkmanshulme	26	29
{ Chorlton-upon-Medlock	192	119
{ Hulme	249	159

One hundred and forty-six cases came from common lodging-houses.

The total number of deaths from Phthisis in Manchester during the year was 1,135.

Five hundred and sixty of these deaths were of cases which had been previously notified to the Medical Officer of Health, and 573 were cases which had not been notified.

At the time when medical practitioners were invited to notify cases of Phthisis, attention was drawn to the facilities offered by the Corporation for the bacteriological examination of specimens of sputum where such an examination would be of assistance in coming to an early conclusion as to the diagnosis in doubtful cases. During the year 258 specimens of sputum have been examined. Tubercle bacilli were found in 104 of these, and were not discovered in 154 specimens.

Cleansing and Disinfection.

The number of houses disinfected by the Corporation with chlorinated lime solution was 581.

In some cases, where the consumptive patient was nursed at home, chlorinated lime solution could not be used on account of the irritating effect of the chlorine on the respiratory organs of the patient. In these cases a milk of lime was used. These cases numbered 109.

In many cases the bedding and personal clothing of the patient has been disinfected by steam. In other cases it has been well washed in boiling water. Esmarch's method of disinfection of wall-papers with dough has been carried out in 1,299 houses during the year.

In these houses the floors and painted surfaces have been well washed with soap and water. The bedding and personal clothing of the patient were also well washed in boiling water.

In a very small number of cases the tenants have refused to carry out any measures of disinfection.

The common lodging-houses are limewashed throughout twice a year, in accordance with the requirements of the Public Health Act of 1875.

The supervision of these common lodging-houses is carried out by the police, and an inspector and one constable are set apart exclusively for this duty. If any houses are found in a dirty condition the owners are prosecuted.

The Medical Officer of Health, by the instruction of the Sanitary Committee, has caused placards to be placed in every room of all the common lodging-houses in the city, pointing out the danger of spitting on the floor. For carrying this out the Sanitary Committee are indebted to the kind offices of the Watch Committee.

Although there has been a great improvement in this respect, it is apparently impossible altogether to prevent spitting on the floors at present.

Where evidence of such infection has been found, the common lodging-house has been disinfected by the Corporation with chlorinated lime.

Home Isolation.

In most cases it was found that no attempt had been made to isolate the patient at home, and as many of the patients are in total ignorance of the precautions necessary as to the disposal of sputum, etc., it is evident, in most of the houses occupied by consumptives, that infective material is scattered broadcast.

In some cases, however, isolation is fairly good. One hundred and forty-four patients were found to be using a separate bedroom, and these patients were for the most part carrying out the necessary precautions as to the disposal of their expectorations.

In 40 other cases, where the household accommodation would not admit of the patient monopolising a bedroom, a separate bed had been provided for the patient.

The number of investigation sheets filled during the year was 1,324.

At one time, when there was a great accumulation of work, cases which died were handed over to the inspector to be at once dealt with, so that no delay should occur before disinfection was carried out. One hundred and forty-five of these cases were not visited by the Assistant Medical Officers.

The total number of cases visited by the Assistant Medical Officers was 1,179.

In many cases it was necessary to pay three or four visits before the patient, or any person capable of giving information respecting the patient, could be found in the house. This was especially the case in the summer months.

On visiting many of these houses, it was found that the patient had gone into the workhouse, and that there was no one left who could give any information about the patient.

This was the case in 406 instances.

Deducting these from the 1,179 cases visited, we get 773 cases in which there was some information available, either by interviewing the patient himself, or his relatives, or an intimate friend.

The probable source of infection was traced in 410 out of the 773 cases, *i.e.*, in 53 per cent. of the cases.

In many of the cases, where no source of infection could be ascertained, the patient himself was not seen. In these cases practically no particulars could be obtained as to the patient's workplace or workmates, and thus an important possible source of infection was left without investigation.

There were, further, 87 cases in which exposure to infection at a more remote period was ascertained, but still at such a time as may have been the starting point of the disease.

The most common source of infection, is a consumptive person living in the same house.

(a) Cases which have been infected by living in the same house as a relative suffering from consumption.

Of these, which numbered 232, the presumed source of infection was—

The father of the patientin 71 cases.

„ mother	„	.....	„	42	„
„ sister	„	.....	„	32	„
„ brother	„	.....	„	26	„
„ husband	„	.....	„	27	„
„ wife	„	.....	„	13	„
„ son	„	.....	„	7	„
„ daughter	„	.....	„	11	„
„ uncle	„	.....	„	1	„
„ cousin	„	.....	„	1	„
„ grandmother	„	.....	„	1	„

232 „

In one of these cases the patient had, apparently, been infected twice, and recovered from the first infection. Her history is as follows:—She is 40 years old. She was very healthy until her marriage. Her husband contracted phthisis, and she nursed him until his death, 11 years ago. A few months after his death she began with a slight cough. This persisted, got worse, and was followed by loss of flesh and night sweats. Two medical attendants diagnosed phthisis. She continued to be very ill for a year, when she began to improve, put on flesh, and got without her cough. She remained well for 8 years, doing her own housework, washing, etc. Two years ago her brother, whom she had seldom seen for many years, came to live with her because he was too ill to work. He was in the last stages of phthisis, and died two months afterwards. Six to seven months after his death a cough began to trouble her, and she is now losing weight, and has become very weak, and has well-marked phthisis.

(b) *Patients infected by living in the same house as a consumptive who was not a relative.*

These cases numbered 15 :—

Case 78. M. 50.—Patient lived with a man for 11 years, who died of phthisis 9 years ago. They used to sleep together. Patient has been ill 9 years.

Case 128. M. 57.—Patient lodged for $1\frac{10}{12}$ years with a man who died of phthisis 7 years ago. Patient has been ill 6 years.

Case 294. F. 20.—Was a servant for $1\frac{1}{2}$ years in a house where there was a case of phthisis. She left $1\frac{1}{2}$ years ago. Her illness commenced about 18 months ago.

Case 337. M. 46.—Patient has been ill 5 to 6 years. Previous to that he had lived with a consumptive for 2 years.

Case 507. M. 38.—Patient's mother-in-law came to live with him $1\frac{4}{12}$ years ago. She was in the last stage of phthisis, and died 3 months after coming here. Patient helped to nurse her, and spent a good deal of time with her. He has been ill 1 year.

*Case 514. F. 39.—Ill 8 months. Lived with a landlady, who died of phthisis 3 months before patient's illness began. This woman spat freely on the floor, rugs, etc.

*Case 635. M. 23.—Ill 4 months. Slept in same bed with a consumptive for 3 or 4 months, ending 1 year ago. This consumptive spat all over the floor.

*Case 673. M. 17.—Ill 1 year. For the last 3 years patient has been an inmate of a school of correction in a small town in Yorkshire. The Medical Officer of Health of this town, on being communicated with, stated that there had been during the last few years "an epidemic of tuberculosis in this school, many cases of tuberculosis of the lungs, glands, bones, etc., having occurred."

Case 600. F. 26.—Six years ago a man died of phthisis, at whose house patient had been a servant for 2 years. During the last 6 months of this man's illness, patient was in almost constant attendance on him. She has been ill for 5 years.

*Case 904. F. 6.—Ill 6 months. Patient's father is a tailor, and in his workroom at the top of the house is employed a workman who has been consumptive for several years. He spits freely on the floor of the workroom, where patient often plays about with fragments of cloth, etc.

(c) *Patients who had been intimately associated with consumptive relatives though not actually living in the same house.*

These cases are 57 in number :—

Case 438. F. 37.—Patient has been ill 3 to 4 years. Five years ago her brother died of phthisis. Patient was with him a good deal, and helped to nurse him. Four months ago patient's husband began to be ill, and is now suffering from phthisis. Evidently this patient was infected by her brother, and has herself infected her husband.

Case 479. M. 50.—A sister, who had lived next door to patient, died of phthisis 5 years ago. Patient used frequently to sit with her. He has been ill about 4 years.

*Case 554. F. 24.—Ill 4 months. Sister died of phthisis 2 months ago after an illness of several years, during which patient often visited her.

*Case 583. M. 41.—Ill 6 months. Sister died of phthisis 1 year ago after an illness of several years, during which she and patient often visited each other.

*Case 648. M. 57.—Ill 6 months. Patient's daughter is in the last stages of phthisis. She lives in Leeds, but used to visit her father.

Case 667. F. 22.—Patient lived next door to an uncle who died of phthisis 3 years ago. She was with him very often, especially during the last 6 months of his illness. Patient has been ill 3 years.

Case 789. M. 45.—Brother died of phthisis 10 months ago. Patient often visited and sat with him. Patient has been ill 6 months.

(d) *Patients who had been intimately associated with consumptives who were not relatives and who did not live in the same house.*

There were 28 of these cases :—

Case 112. M. 25.—Ill 1 year. For 4 years he was very intimate with a friend who died of phthisis 14 months ago.

Case 159. F. 23.—Ill 6 months. A very intimate friend died of phthisis 8 months ago.

Case 255. M. 40.—Ill 1 year. This man spent a lot of time with a friend who died of phthisis 1½ years ago.

Case 345. F. 21.—Ill 1 year. An intimate friend, with whom patient spent a lot of time, died of phthisis $1\frac{1}{2}$ years ago.

Case 525. F. 26.—Ill three months. A friend, with whom patient has spent a good deal of time, has had phthisis for 2 years.

*Case 620. F. 14.—A woman who lived next door to patient had phthisis, and patient went into this house every day and waited on the woman, and often cleaned out her sputum pot. This woman left the house 3 months ago.

*Case 780. M. 27.—Ill 5 years. Six years ago he became engaged to a consumptive girl, who died $4\frac{1}{2}$ years ago.

*Case 928. M. 29.—Ill 2 years. Was very intimate with a patient who died of phthisis 1 month ago, after an illness lasting 4 years.

*Case 1058. M. 23.—Ill 4 months. For 8 years patient has been intimate with a man who has had phthisis for 5 or 6 years. This man makes patient's clothes, and patient has often seen him spit on the floor of the workroom.

*Case 1121. F. 59.—Ill about $2\frac{1}{2}$ years. For 9 months she nursed a patient who died of phthisis 4 years ago. She often sat up all night with this patient, who insisted on having all the windows closed, "making the house stuffy."

In two cases (Dr. McCleary) patients appear to have contracted the disease by living in houses which had been infected by previous consumptive tenants. A history of this nature is extremely difficult to obtain, as it is only in exceptional cases that the patients know anything whatever of the previous tenants. If it were possible to get to know more of the history of the previous occupants of many of the houses, there is little doubt that there would be many more cases in which the disease was due to house infection.

*Case 1263. F. 42.—Strongly built. No family history of phthisis. Ill $2\frac{1}{3}$ years. Came to live in present house 3 years ago. Ten days before, a man died of phthisis after an illness of 2 years, during which he occupied, and died in the bedroom patient has since occupied. In this room she has been confined three times, the first time being a fortnight after coming into the house. The room was not repapered or thoroughly cleansed till patient had been in it a year. Patient was strong and well when she came to live in this house, but began to have symptoms of consumption 8 or 9 months after her arrival.

*Case 1040. M. 36.—Patient has been ill 1 year, and has lived in this house $3\frac{1}{2}$ years. The previous tenant died of consumption 3 weeks after leaving this house. He was ill 2 years. The bedrooms and kitchen were not repapered when the patient came into the house, and the bedrooms are still in the condition in which they were when patient came into the house. This patient's wife died of phthisis 5 years ago, and possibly she is the source of his infection, in part at least.

The following cases investigated by Dr. McCleary appear to have been infected by living next door to a consumptive. The possibility of infection in this manner was pointed out by Flick, who found many facts to support it in the course of his 25 years study of the distribution of tuberculosis in Philadelphia. Hermann Biggs has pointed out that a study of the spot maps, in which is shown the distribution of tuberculosis in New York city, supports Flick's theory. The exact method of infection is not quite clear, but in your Annual Report for 1899 you suggest that "in the processes of removing dust, shaking carpets, and so on, from an infected house, probably the air becomes sufficiently impregnated with tuberculous dust to infect persons in an adjacent dwelling."

In this group are 20 cases. In 18 there had been no intercourse between the inmates of the houses; in the remaining two there had been a few visits interchanged.

Case 610. F. 44.—Ill three months. For two years, ending six months ago, lived next door to a consumptive.

Case 677. M. 19.—Ill $2\frac{1}{2}$ years. For a year lived next door to a consumptive, who died three years ago.

Case 906. F. 12.—Ill four years. A mother and daughter came to live next door seven years ago. The daughter died of phthisis four years ago after an illness of one year. She died of same disease two years ago, after an illness of two years.

Case 1228. M. 46.—Ill over four years. Three men (brothers) died of consumption next door, two nine years ago, one five years ago.

In all the above cases there had been no intercourse between the inmates of the adjacent houses.

In the following case there had been slight personal intercourse :—

Case 1310. M. 36.—Ill 15 months. A consumptive patient lived next door for a year, ending a year ago. This man occasionally came to the patient, but the visits were never returned.

In two cases the infection appeared to have been acquired by living opposite to a consumptive :—

Case 1125. F. 26.—Ill two years. Three years ago lived for eight months in a narrow street opposite to a girl who was in an advanced stage of phthisis. The mats, etc., from this house were shaken at the front door.

In the following cases there appear to be grounds for suspecting the primary infection to have been milk-borne :—

Case 412. M. 18.—Patient had “consumption of the bowels” when an infant. Was hand-fed. Thirteen years ago he had meningitis, and again 12 years ago. Cough began one year ago, and wasting six months ago. Four of his brothers and sisters, all bottle fed, have died of “consumption of the bowels”—one 12 years ago, one 10 years ago, and two of them 6 years ago.

Case 413. M. 11.—Had “consumption of the bowels” when an infant (bottle fed), and has had “bronchitis” ever since. A brother died about 10 years ago of “bronchitis” and “wasting,” following “consumption of the bowels.”

Case 1051. F. 5.—This girl was very healthy up to being 10 months old, when she was weaned, and fed on unboiled cow's milk. She then got “consumption of the bowels,” which was followed by “bronchitis,” which still persists.

*Case 724. M. 15.—Has been ill 8 months. No family history of tuberculosis. Phthisis is secondary to tuberculosis of the peritoneum and kidneys. Patient's father keeps a milk shop, and patient drinks over two pints of milk daily, always unboiled.

In the following case the patient was probably infected at his beerhouse :—

Case 467. M. 39.—Patient and his family were quite healthy when coming to live at this beerhouse. Since coming here he has lost a son and a daughter from phthisis, and has himself contracted phthisis. This public-house is situated in a rather low quarter of the city, and is frequented by market porters, etc., who spit about the floor freely.

Cases in which infection was probably acquired while the patients were engaged in following their daily occupations :—

A.

Warehousemen in the Grey Cloth Trade.

In most of these warehouses chronic cough appears to be very common. According to the statements of patients who have been visited, the men invariably spit about on the floor, etc. There is a good deal of dust (china clay and sizing) given off while handling the cloth, and this dust will no doubt excite coughing and spitting in those suffering from chest affections. The sputum mixing with the dust will dry more rapidly, and be disseminated in the atmosphere.

Case 189. M. 22.—Patient remembers three of his fellow-workers who have left on account of cough, and one of these has since died. He has worked here 9 years. His illness began 1 year ago.

Case 213. F. 27.—Has been ill 4 years. A workfellow died of phthisis about the time patient's illness commenced. Two others are now attending the Consumption Hospital.

Case 318. M. 32—Ill 3 to 4 years. Has worked here 10 years. Two fellow-workers have died of phthisis since he came here, and another is now very ill with phthisis. Three others are said to be away from work with bad chests.

Case 319. M. 36.—Has worked with many consumptives, and knows several who have died of phthisis. The workmen spit anywhere about the floor.

Case 86. M. 29.—Patient's illness began about September, 1899. A man left in December, 1899, on account of having phthisis (case 318). He had been ill 3 years, during which time patient was working near him. There have been several cases here (see case 318).

Case 87. M. 40.—Has been ill 8 years. Two of his fellow-workers at the place where he was working when his illness began had phthisis, and many others had bronchitis.

Case 123. M. 18.—Ill 1 year. This patient did not know that he had ever worked near a consumptive, but since visiting him I have seen a man who has had phthisis for 8 years, and who has been working near this patient for 5 years. They were often handling the same pieces of cloth.

*Case 1191. F. 27.—Has been ill nearly 2 years. For 5 months, up to 2 years ago, worked next but one to a woman who had phthisis, and who spat freely on the floor.

It is often very difficult to get a definite history of contact with a consumptive workfellow, even when such contact has clearly existed. This is partly due to the fact that the disease is generally not recognised as phthisis by the patient or his friends and fellow-workers until the disease is far advanced.

It is a common experience to visit patients in the advanced stages of phthisis who have no idea of their actual condition, but who call their complaint "bronchitis," "asthma," etc.

Many warehousemen can tell of working with cases of "chronic cough," "bad chest," etc., and although they do not know these to be cases of consumption, there is little doubt that many of them were phthisical patients.

Case 88. M. 45.—A warehouseman for 18 years. He has been ill 5 years. He has known many fellow-workmen with bronchitis and bad cough. The beginning of his illness was an attack of influenza 5 years ago.

Case 55. M. 22.—Has been ill $1\frac{1}{2}$ years, and has worked here 9 years. He does not remember that any of his fellow-workers have suffered from phthisis, but many of the warehousemen suffer from asthma and bronchitis, and there is always someone away from work on account of having a bad chest.

Girls and Women employed in making Underclothing and Dresses.

Case 279. F. 23.—A machinist for 11 years at this workshop. Has been ill 1 year. Patient knows of many girls who have left on account of ill health. There are 3 others at this place, besides patient, who are attending at the Consumption Hospital on account of having phthisis.

*Case 628. F. 22.—Dressmaker. Ill 7 years. Six years ago she left a shop where she had worked $2\frac{1}{2}$ years, and where the mistress had discharging tubercular glands and a cough.

*Case 902. F. 24.—Mantle maker. Until 2 years ago patient worked next to a consumptive, and had done so for 2 years. Patient has been ill $1\frac{1}{2}$ years.

*Case 944. F. 26.—Has been ill one year. Worked in same room as a patient who died of phthisis 2 years ago.

*Case 1014. F. 23.—A shirt folder at the same workplace for 7 years. Began to be ill 2 years ago. Two girls died of phthisis 3 years ago who had worked at the same table as patient for several years. One of these was constantly spitting on the floor. Another girl from this workshop has recently died of phthisis.

*Case 1186. F. 29.—Three years ago worked next to a girl who probably had phthisis. Patient is a box maker, and has been ill 2 years.

Case 1198. F. 23.—A corset maker. Ill 3 months. A girl who worked near patient left 6 months ago on account of phthisis. This girl used to spit in her handkerchief, and on the floor.

During the year, 10 cases have been investigated who were employed in various dyeworks.

Of these, 7 were employed in one particular dyeworks. During the preceding quarter there were 3 cases from the same dyeworks, so that within 15 months we have visited no fewer than 10 cases of phthisis occurring among the workpeople of this particular firm. Of the 7 cases visited during 1900, one of them (Case 128, M. 57) was not infected at the works, and in another (Case 936, M. 18) there is a history of exposure to infection apart from his occupation. This man has been ill 3 years, and he often visits a married sister who has had phthisis for eight years.

In the other 5 cases, viz. :—

Case 122. M. 35.—Ill 1 year, left the works 1 year ago.

Case 194. M. 38.

Case 245. M. 22.—Ill 7 years.

Case 284. M. 52.—Ill 3 years. Has worked here 30 years, and had to leave 3 years ago on account of illness.

Case 333. M. 27.—Ill 3 years. Had to leave his work 2 years ago.

The evidence goes to show that this workshop was a centre of infection.

Certain of the processes carried on in these works were very dusty, Cases of “bronchitis” and “bad cough” were very common among the workpeople and it appears to be a universal habit to spit on the floor, etc.

In the early part of the year this works was closed, and therefore there has been no opportunity to make any investigations at the workshop.

There were 3 other cases among dye-workers, but they were from 3 separate workshops, and there was no evidence to connect their illnesses specially with their occupation.

*Case 1157/00. M. 28.—Bricklayer's labourer. Ill 3 months. For 7 months, ending 9 months ago, patient worked with a man who had phthisis. (Case 416/00.)

*Case 1168/00. M. 36.—Bricklayer's labourer. Ill 6 or 8 months. For seven months, ending 2 years ago, he worked with a man who had a bad cough, with thick, yellow sputum.

Case 13/00. M. 45.—A labourer at a tarpaulin works. Patient has been ill 2 years. Left work on account of illness $1\frac{1}{2}$ years ago. Three of his fellow-workmen had left work on account of phthisis before he left, and many others had a chronic cough. The workshop is said to be badly ventilated, and there is a good deal of smoke produced in connection with the work, which makes the men spit and cough. They spit on the floor. There have been 2 other cases among the workpeople at these works.

Case 72/00. M. 30.—A core maker. Before his illness patient worked for over a year (contact ceased 2 years ago) with a man who had phthisis. Patient has been ill 2 years, and tubercle bacilli are present in his sputum, but until now he was unaware that he was suffering from phthisis.

*Case 1234/00. M. 40.—Fitter in machine shop. For 6 months, ending 1 year ago, worked very near a consumptive. Ill 6 months.

Case 110/00. M. 40.—A machine-man in a large ironworks. His illness began with hæmoptysis 7 years ago. Eight years ago a man who had worked with patient on the same machine for 3 years died of phthisis.

Case 64/00. F. 22.—Ill 2 years. For 6 years worked at the Linotype Co.'s Works in Hulme, which were closed about 2 years ago. These workrooms are said to have been overcrowded, and badly ventilated. There were two girls who worked here with patient suffering from phthisis. (Case 31/99, ill 5 years. Case 131/99, ill 2 or 3 years.)

*Case 513/00. M. 30.—Tin-case maker. Ill 3 years. Patient states he has often worked in the same rooms as consumptives.

Case 623/00. M. 17.—A clerk. Ill 1 year. Two years ago patient went to work next to a clerk who had phthisis, and worked next to him for a year.

*Case 816/00. M. 43.—Clerk. Two years ago he worked next to a man who had had phthisis for 4 months. Patient has been ill 14 months.

*Case 856/00. M. 37.—Steel-smelter. Four years ago a workfellow died of phthisis after an illness of 3 years. Patient has been ill about 4 years.

*Case 901/00. F. 38.—Carding-room hand in cotton mill. Ill 3 years. Up to 2 years ago patient had worked with a consumptive for 4 years.

Case 351/00. M. 38.—A draper in a large shop. Has been ill 6 years. He worked with a man who died of phthisis six years ago.

Case 372/00. M. 62.—A joiner. Ill 6 years. Worked for several years with a man who died of phthisis.

Case 406/00. F. 18.—Does not know of any girls who had phthisis, but other cases have been reported from same workplace. Patient has been ill 6 months. (Also case 287, who has been ill $1\frac{1}{2}$ years).

*Case 1119/00. M. 38.—Brush maker. Worked at same place as a consumptive who died 6 years ago. Patient has been ill six years.

Case 190/00. M. $19\frac{1}{2}$.—A flannellette raiser. Very dusty work. Many of his fellow-workmen had “bad coughs,” and one he knew had phthisis.

Case 200/00. M. 24.—Ill 3 years. This patient did not know of anyone who had phthisis, but other cases have been notified from the same workshop, namely :—

Case 289/99. M. 22.—Ill 1 year.

Case 642/00. M. 24.—Ill 6 months.

Case 715/00. M. 45.—Ill 6 months.

Case 280/00. M. 26.—Baker. Ill 2 years. Patient knew several of his fellow-workmen who have had “baker’s cough,” and two who have died of phthisis.

Case 281/00. M. 32.—A printer. Ill 2 years. There have been several other cases (4 or 5) at this workshop (a printing works), viz. :—

Case 185/99. M. 31.—Ill 2 years.

Case 265/99. F. 32.—Ill 6 years.

Case 269/99. F. 26.—Ill 3-4 years.

Case 35/00. M. 57.—Ill 6 years.

Case 310/00. M. 40.—A stoker at Bradford Road Gas Works, Manchester. There have been 3 cases among the stokers here. Patient has been ill 2 years.

Case 318/00. M. 31.—Ill 6 months.

*Case 967/00. M. 55. Stoker, gas works. Ill 3 months. For the last 2 years has worked near two consumptives, who spat freely on the floor.

1st consumptive—Died 3 months before date of investigation.
Ill 18 months.

2nd consumptive—Still living at date of investigation. Ill 12 months.

*Case 977/00. M. 43.—Ill 2 years. Velvet finisher. Three years ago there were several men working near patient who were consumptive.

*Case 1062/00. M. 41.—Stonemason. A fellow-workman died of phthisis 15 months ago after an illness of 2 to 3 years, during which time patient worked with him. Patient has been ill 2 years.

*Case 683/00. M. 56.—Stonecarver. Ill 2 years. Many of his fellow-workmen have had consumption.

Case 385/99. M. 40.—A stonemason. Ill 5 years. Has worked with several men who had consumption.

*Case 1123/00. M. 40.—Stonemason. Ill 1 year (probably longer). A workfellow died $3\frac{1}{2}$ years ago who worked opposite to patient, and whose expectorations were very offensive.

Case 421/00. M. 52.—A grinder at ironworks. Ill 6 years. Several of his fellow-workers have died of phthisis. Other cases reported from same works, namely :—

Case 391/99. M. 55.—Ill 1 year.

Case 480/00. M. 47.—Ill 1 year.

Case 523/00. M. 21.—Ill 4 years. Not at this works for last 2 years.

Case 530/00. M. 28.—Cough since childhood. Not at this works for last 8 years.

Case 675/00. M. 19.—Ill 2 years.

Case 480/00. M. 47.—Ill 1 year. A grinder at same works as Case 421.

Case 756/00. M. 45.—Ill 4 years. About 18 months before his illness began he went to work where there were 3 men with "stonemason's cough."

House Decorators and Whitewashers.

In the poorer class of houses it is the habit of these men when they have to re-decorate a house to tear away all the old paper which is hanging loosely on the wall, and which they can remove without soaking with water. In this process quantities of dust from the paper are distributed in the air of a room and inhaled. Whitewashers also, before whitewashing the walls or ceiling of a room, brush them down with a dry brush, and so fill the air of the room with dust.

Men engaged in these occupations will certainly be employed in a certain number of houses containing consumptive patients, most of whom will probably have been taking no precautions as to the disposal of their expectorations. The dust in these houses being, therefore, infected dust, the men inhaling it will be exposed to the risk of contracting phthisis.

Case 256. M. 48.—Ill 14 months. This man stated that many of the houses he went to clean and whitewash were very dusty and dirty. He swept the walls with a dry brush before whitewashing, and this used to fill the air with dust. He was very strong and healthy before taking up this occupation, and his health began to fail when he had been doing this work 9 months. He is now unable to work, and has well-marked phthisis.

Case 227. M. 39.—This man's wife said that her husband often complained of the dust caused by stripping the paper while dry off the walls of dirty houses. There is no family history of tuberculosis, and careful enquiry failed to reveal any other source of infection. He has been ill 1 year.

Case 12. M. 59.—Ill 2 years. Case 23. M. 27.—Ill 1 year.

These two men gave a similar account of the way in which they worked, and stated that a good deal of dust was produced.

Case 229. M. 46.—Ill 4 years. This man said he had "stripped scores of houses." He pulled the paper off dry, and this caused a good deal of dust.

B.

In the following 568 cases, the occupations are given of consumptives at the probable time of infection. The particular workshops in which they were then working do not admit of classification, but form the basis of the following observations :—

Engaged in gas works, of whom 4 were stokers	...	...	...	...	...	...	...	...	...	8
Drivers, and engaged in stables	...	...	...	...	...	...	...	...	...	15
Engaged in cotton mills	...	...	...	...	...	...	...	...	...	47
Workers in iron, tin, brass, and copper	...	...	...	...	...	...	...	...	...	76
Workers in wood...	...	...	...	...	...	...	...	...	...	20
Velvet fustian cutting, &c.	...	...	...	...	...	...	...	...	...	12
Warehousemen	...	...	...	...	...	...	...	...	...	54
Dyers and bleachers	...	...	...	...	...	...	...	...	...	14
Sewing machinists, &c.	...	...	...	...	...	...	...	...	...	45
Tailors, &c.	...	...	...	...	...	...	...	...	...	27
Rubber workers	...	...	...	...	...	...	...	...	...	17
Umbrella makers...	...	...	...	...	...	...	...	...	...	6
Brokers and upholsterers	...	...	...	...	...	...	...	...	...	13
Shoemakers, &c.	...	...	...	...	...	...	...	...	...	7
Printers, bookbinders, &c.	...	...	...	...	...	...	...	...	...	17
Glass workers	...	...	...	...	...	...	...	...	...	4
Scavengers, engaged in sewers, &c.	...	...	...	...	...	...	...	...	...	5
Rag sorters	...	...	...	...	...	...	...	...	...	4
Grocers...	...	...	...	...	...	...	...	...	...	7
Butchers	...	...	...	...	...	...	...	...	...	4
Bar tenders, waiters, &c.	...	...	...	...	...	...	...	...	...	16
Music-hall singers	...	...	...	...	...	...	...	...	...	3
Tobacco workers...	...	...	...	...	...	...	...	...	...	4
Hatters...	...	...	...	...	...	...	...	...	...	3
Painters and paperhangers, &c.	...	...	...	...	...	...	...	...	...	11
Plumbers	...	...	...	...	...	...	...	...	...	6
Clay-pipe workers	...	...	...	...	...	...	...	...	...	2
Furriers	...	...	...	...	...	...	...	...	...	4
Stonemasons	...	...	...	...	...	...	...	...	...	8
Railway employés	...	...	...	...	...	...	...	...	...	10
Various...	...	...	...	...	...	...	...	...	...	99
										<hr/>
Total...	...	...	...	...	...	...	...	...	...	568
										<hr/>

These must be taken along with the cases given under “A,” when the superiority of the method of direct investigation over that of statistics is at once apparent. It is manifest, indeed, that it must be so as long as a minor

part of the cases are notified. Moreover, the place of work has not in all these cases been obtained, so that gaps occur in the facts.

The first heading under which multiple cases occur in such a manner as to suggest the influence of works is :—

Ironworks—Workshop 1—8 cases

Do. —Workshop 2—4 cases

The next is velvet cutters, one workshop having two cases. This is the same firm as appears under dyeworks with 7 out of 11 ascertained dyers and bleachers.

There can be no doubt about this case.

It is remarkable, after the indictment brought against warehouses by the particulars given under “A,” that under “B” very little appears.

There are only two instances recorded of multiple cases notified, viz. :—

Workshop 1—3 cases

Workshop 2—2 cases

Amongst tailoring establishments, there is only one firm with more than 1 case, the number being 3.

In the case of rubber works, one firm has 4 cases, a second 4, and a third 3. In the first instance there is strong presumption of infection.

Among printers and bookbinders one firm stands out conspicuous with 5 out of 17 cases, nor can this be assigned to exceptional number of workpeople.

It is interesting to note that 2 out of 5 scavengers are engaged at the Holt Town manure works.

Two of the four tobacco workers are engaged at one firm, and it is only surprising that more persons engaged in this business do not appear on the list.

The painters, paperhangers, etc., are mostly without a precise place of business, so that comparison with the remarks under “A” is impossible.

Of the railway employés, 5 out of 11 belong to one railway, but there is independent reason to believe that the cleaning and upholstering of railway carriages is a risky business with the present arrangements for cleanliness.

Amongst the various employments, the most noticeable is that of porter and labourer in the Shudehill Market. Of these persons there are 7. There is no doubt that much spitting goes on in the market, and the residual cabbages, etc., upon which cows are fed are presumably a risky food for dairy cattle.

This review, then, though it does not furnish the evidence which direct enquiry into histories of infection affords, gives fresh suggestions, and opens up new lines of investigations and administration.

In 67 cases there was a history of exposure to infection at a period rather more remote, but still at such a time as may have been the starting point of the disease.

In these cases known exposure to infection ceased at periods varying from 2 to 6 years before symptoms of the disease were noticed.

Case 296. M. 21.—Patient has been ill 2 years. He lived with his father, who died of phthisis 6 years ago.

Case 455. M. 40.—Son died of phthisis 10 years ago. Patient has been ill 6 years.

Case 535. M. 37.—Two of patient's sisters, whom he often visited, died of phthisis 8 and 12 years ago respectively. Patient has been ill two years.

*Case 972. M. 20.—Ill 1 year. Two sisters died of consumption 7 and 4 years ago. Patient lived in the same house with both.

*Case 990. F. 50.—Ill 4 years. Husband died of consumption 10 years ago. Patient nursed him during his illness.

*Case 1254. F. 46.—Ill over 5 years. Husband died of phthisis 10 years ago. Patient nursed him during his illness.

Phthisis is so insidious in its onset, and many of the poorer people do not notice, or remember, apparently trifling symptoms, that in all probability at least 9 to 12 months must be added to the duration of the illness as stated by the patient. This would therefore diminish the latent interval between the exposure to infection and the onset of symptoms in the above class of cases.

The following is a summary of the insanitary conditions found in the houses visited :—

228 houses were found to be in a dirty condition.

45 were back-to-back houses.

80 of the houses were damp, and in

89 houses other insanitary defects were found, chiefly defective yard surfaces, blocked gullies, etc.

7 of the houses were badly lighted.

In many cases the disease has been immediately preceded by a severe illness, which has apparently acted as a predisposing cause, or has afforded an opportunity for the latent disease to manifest itself.

The following is a summary of these illnesses :—

- Enteric Fever in 4 cases
 - Smallpox in 1 case
 - Diabetes in 1 case
 - Measles in 7 cases
 - Whooping Cough in 3 cases
 - Influenza in 19 cases
 - Pneumonia in 18 cases
 - Pleurisy in 8 cases
 - Meningitis in 1 case
- } Probably the symptoms of the disease which were first noticed

Three hundred and seventy-two of the patients were narrow chested, and 122 others were of feeble physique, although not markedly narrow chested.

Probably both these numbers would be largely increased if we had been able to see the whole of the patients, but in a large number of cases we had to be satisfied with the statements of relatives or friends. In 223 cases the patient was of intemperate habits. Here also the number of alcoholics is probably largely underestimated.

SUMMARY.

History of probable source of infection obtained :—

Living with a consumptive	247
Intimate association with a consumptive though not living in the same house	85
Living in a previously infected house... ..	2
Infected in workshops... ..	51
Infected by milk—phthisis being secondary to tuberculosis of the bowel... ..	4
Infected in public-houses	1
Infected by living next door to a consumptive, direct personal intercourse being absent or slight	20
	— 410
Cases in which exposure to infection has occurred at a more remote period, but not so remote as to preclude the possibility of such exposure being the starting point of the disease	67
Cases withdrawn (diagnosis uncertain, etc.)	7
Cases in which no source of infection could be traced	289
Cases in which there was no information available	406
Cases not visited on account of death previously taking place ..	145
	— 1324

REPORT ON AN INVESTIGATION INTO THE INFECTIVE POWER OF THE DUST
IN HOUSES INHABITED BY CONSUMPTIVE PERSONS, BY HAROLD
COATES, M.B., Ch.B., D.P.H.

Public Health Office,

Manchester,

February, 1901.

To the Medical Officer of Health.

In October, 1899, the Hospitals Sub-Committee, acting on your suggestion, passed a resolution to the effect that I should commence an investigation into the infectivity of the dust found in the dwellings of consumptive patients under the direction of Professor Delépine.

This work was commenced in November, 1899, and the experiments connected with it were only concluded in September, 1900.

The bacteriological work has been done in Professor Delépine's laboratories at Owens College, and I owe much to Professor Delépine's kindness in giving me advice and assistance during the investigation. All the inoculations have been made by Professor Delépine or his Assistant (Dr. Sidebotham).

The object of the investigation was to ascertain if infective material in dangerous amount accumulated in houses occupied by consumptive patients.

It is the habit of many of these consumptive patients to spit about on the floor of the room they occupy, or to spit into their pocket-handkerchiefs.

In either case the sputum quickly dries, and either by being trodden under foot or by the friction produced when the handkerchief is used the dried sputum is ground into a fine dust, which becomes suspended in the atmosphere by currents of air.

As in the advancing stages of phthisis, the expectorations contain immense numbers of tubercle bacilli, and as these bacilli can retain their virulence in the dry condition, a large amount of infective material is set free in the atmosphere of the room occupied by patients who spit upon the floor or into pocket-handkerchiefs.

This infective dust will ultimately settle on the walls, floor, and articles of furniture in the room, and may again be disturbed and suspended in the atmosphere by strong currents of air, or by sweeping the floor, dusting the furniture, etc.

The following is a brief account of the methods employed to ascertain whether or not the presence of virulent infective dust could be demonstrated in these houses.

Samples of dust from various situations in the room under investigation were collected with strict aseptic precautions. These samples were always taken from such a situation that direct infection with sputum was impossible. The dust collected, therefore, was dust which must at one time have been suspended in the atmosphere, and was capable of being inhaled by persons using the room. This dust was mixed with sterilised water, and was then used to inoculate guinea pigs. If the dust contained living tubercle bacilli, the effect of the inoculation was that the animal developed tuberculosis. In many instances the animals inoculated died within 48 hours of inoculation from septic diseases, due to the presence of other germs than the tubercle bacillus in the dust.

Those guinea pigs which survived the inoculation were killed a month afterwards, and a post-mortem examination was made of each animal.

If tuberculous lesions were found, a microscopical examination was made of the diseased tissues, and the presence of tubercle bacilli demonstrated.

This was direct proof that the dust with which the animal had been inoculated contained living tubercle bacilli, and that the presence of such infective dust in an inhabited room was dangerous.

Persons inhaling such dust would be in great danger of contracting phthisis.

The houses in which investigations were carried out are classified as follows :—

I.—Houses which are in a dirty condition, and in which a consumptive patient is living who is taking no precautions to dispose of his expectoration, so as to prevent infection of the atmosphere, but who spits freely on the floor, or into his pocket-handkerchief, etc.

II.—Houses which are in a very clean condition, but in which a consumptive patient is living who is not sufficiently careful in the disposal of his sputa.

III.—Very dirty houses, in which there has been no case of tuberculosis for some years past.

Class I.—Houses which are dirty, and containing a phthisical patient, who spits about the floor, etc.

District	Number of Experiment	Date of Visit	Parts from which Dust was taken	Light and Ventilation	Number of Animals Inoculated	Positive Results	Negative Results	Remarks
Ancoats	1	1899 Nov. 6	Wall near floor	Fair	2	0	1	
Holt Town.....	2	„ 9	Floor	Good	2	1	...	Dust infective
Ancoats	3	„ 13	Walls near floor	Poor	2	1	...	Dust infective
St. George's ...	4	„ 21	Wall 4 feet from floor	Poor	2	0	0	*
St. George's ...	5	„ 21	Wall 4 feet above floor	Good	2	1	...	Dust infective
Newton	6	„ 22	Mantel-piece	Good	2	Tubercle bacilli found by microscope		Dust infective
St. George's ...	7	Dec. 2	Skirting-board ...	Poor	2	1	...	Dust infective
Harpurhey	8	„ 8	Wall and skirting-board	Good	2	1	...	Dust infective
Hulme.....	9	„ 15	Wall and skirting-board	Good	4	0	4	
St. George's ...	10	1900 Jan. 20	Wall and skirting-board	Bad	4	2	2	Dust infective
C.-on-M.	11	„ 23	Wall and near the floor	Good	4	0	2	
Openshaw	12	Feb. 5	Wall and near skirting	Good	2	0	1	
Newton	13	„ 7	Wall and near floor	Good	2	0	2	
Hulme..	14	„ 15	Staircase and wall	Bad	2	2	0	Dust infective
Ancoats	15	„ 22	Mantel-piece and near floor	Good	2	0	0	*
C.-on-M.	16	„ 24	Mantel-piece and near floor	Bad	2	2	...	Dust infective
Newton	17	Mar. 2	Wall and floor	Good	2	1	...	Dust infective
Hulme	18	„ 12	Mantel-piece and near floor	Bad	2	2	0	Dust infective
West Gorton ...	19	„ 15	Wall and floor	Poor	2	1	...	Dust infective
Hulme.....	20	„ 19	Wall and floor	Good	2	0	1	
Ardwick.....	21	July 4	Mantel-piece and near floor	Bad	2	1	1	Dust infective
Hulme.....	22	„ 4	Wall and floor	Fair	2	1	...	Dust infective
Ardwick	23	„ 4	Wall	Good	2	...	1	

* In two of these houses, none of the animals survived the inoculation more than two days, and, therefore, these two experiments were inconclusive.

Twenty-three houses of this class were examined. Deducting the two houses in which the result was inconclusive, there are 21 houses left for consideration. Infective dust was found in 14 out of these 21 houses—that is to say, in 66·6 per cent. of the houses investigated direct experimental proof was obtained of the presence of infective dust, which, if inhaled, could give rise to consumption.

The houses of this series were situated in different parts of the City, viz., three in Ancoats, four in the St. George's district, five in Hulme, two in Ardwick, three in Newton, two in Chorlton-upon-Medlock, and one in each of the following districts—Openshaw, Harpurhey, Holt Town, and West Gorton.

Class II.—Clean houses, in which a consumptive is living who expectorates on the floor, etc.

District	Number of Experiment	Date of Visit	Light and Ventilation	Number of Animals Inoculated	Positive Results	Negative Results	Remarks
Longsight....	24	1900 March 28	Fair	2	2	...	Dust infective
Ardwick	25	„ 23	Good	2	...	2	
Ancoats	26	April 2	Good	2	...	2	
Hulme	27	„ 2	Poor	2	1	...	Dust infective
Ardwick	28	„ 23	Good	2	...	1	
Hulme	29	„ 23	Fair	2	1	1	Dust infective
West Gorton	30	„ 24	Good	2	...	2	
Newton	31	„ 30	Good	2	1	1	Dust infective
Ancoats	32	„ 28	Good	2	...	1	
Rusholme	33	May 1	Bad	2	1	1	Dust infective

Ten of these clean houses were examined.

The conditions of ordinary cleanliness were very good, but in each house there was a consumptive patient who was not taking suitable precautions in the disposal of his expectorations, and who was therefore infecting the atmosphere about him.

In five of these houses (*i.e.*, in 50 per cent.) infective dust was found.

Ordinary cleanliness is not sufficient to prevent infection of the atmosphere, with its attendant danger, to those who breathe the air.

All consumptives are dangerous, both to themselves and others, unless they deal with their expectorations in such a manner as to prevent this contamination of the atmosphere.

These experiments show that in houses occupied by a certain class of consumptives there is a very dangerous accumulation of infective material, and that this infective material is present equally in the dirty houses and in those in which the conditions as regards ordinary cleanliness are above reproach.

To show that this accumulation of infective dust is due entirely to the presence of a consumptive, who is constantly infecting the atmosphere, the following experiments were made.

A number of houses were selected in which it was possible to obtain the history of the inmates for several years past.

Only houses were used in the investigation in which I was satisfied that no case of tuberculosis had occurred for three years or more.

These houses were all very dirty, and corresponded exactly with the houses of the first set of experiments, except that the consumptive patient was absent.

The following are the details of the experiments :—

District	Number of Experiment	Date of Visit	Light and Ventilation	Animals Inoculated	Positive Results	Negative Results	Remarks
Cheetham	34	May 3	Fair	2	0	1	
Hulme	35	„ 3	Good	2	0	1	
Central	36	„ 18	Fair	2	0	2	
Central, Deansgate	37	„ 18	Bad	2	0	1	
Hulme	38	„ 27	Fair	2	0	1	
Hulme	39	„ 27	Bad	2	0	1	
Hulme	40	„ 27	Fair	2	0	2	
Red Bank	41	June 12	Bad	2	0	2	
Central	42	„ 12	Good	2	0	2	
Hulme	43	„ 26	Good	2	0	2	

In no case was infective dust found in these houses. It is evident, therefore, that the tubercle bacillus is only to be found in dwelling-houses when there is a consumptive inmate who infects his surroundings. If a

consumptive patient disposes of his expectorations in such a manner that infection of the atmosphere is prevented, there will be no accumulation of infective dust in his house.

Inasmuch as a very large number of consumptives have neglected to carry out suitable precautions as to the disposal of their expectorations, there will be a dangerous accumulation of infection in their houses, which must be removed by some method of disinfection.

The method in use in Manchester is that of disinfection of walls, floors, ceilings, furniture, etc., by washing with a solution of chlorinated lime, $1\frac{1}{2}$ oz. to the gallon.

To test the efficiency of this method, I have made the following experiments :—

Pieces of paper, infected with tuberculous sputum, were pinned to the walls of rooms about to be disinfected. These test papers were then subjected to the process of disinfection as carried out by the Corporation men. After being allowed to dry, these test papers were used to inoculate guinea pigs.

Control papers were used to inoculate other guinea pigs. In every instance the control papers produced tuberculosis, while the disinfected test papers failed to produce tuberculosis.

Below are the details of the experiments.

DISINFECTION EXPERIMENTS WITH TEST PAPERS.

Number of Experiment	Date of Disinfection	Animals inoculated	Negative results	Positive results
44	July 11th, 1900	2	2	0
45	„ „	2	2	0
46	„ „	2	2	0
47	July 16th, 1900	2	2	0
48	„ „	2	2	0

In every case there was complete proof that the method of disinfection with solution of chlorinated lime is efficient.

The control experiments with paper smeared with the same tuberculous sputum, but not exposed to the disinfectant, are shown in following table.

CONTROL EXPERIMENTS.

Test papers smeared with sputum	Number of guinea pigs inoculated with test papers, and date	Result of inoculation	Paper smeared with same sputum as used in these experiments used in houses
July 10th, 1900	2	Both guinea pigs became tuberculous	44
			45
			46
July 15th, 1900	2	Both guinea pigs became tuberculous	47
			48

Thus the test papers were very infective before being disinfected, but after the disinfection the infective organisms were destroyed. The practical result of these experiments is to show the extreme importance of taking the necessary precautions in the disposal of expectorations, so that there shall be no infection of the floor, walls, etc., and therefore of the atmosphere.

HAROLD COATES.

TUBERCULOSIS AND MILK.

In presenting the statement by Mr. Lloyd of the work done in connection with the Milk Clauses, it will be considered appropriate that some allusion should be made to Koch's announcement at the Congress on Tuberculosis, held in the present year, to the effect that from experiments made by him he had come to the conclusion that human tuberculosis is not communicable to oxen, while from these experiments and other considerations he was disposed to infer that bovine tuberculosis is not communicable to man.

There are facts pointing in an opposite direction, though an authoritative statement such as that made by Koch renders it necessary to review the evidence, and, as far as possible, to obtain conclusive proof on the matter. Probably, the first series of experiments will be directed to settling the question—whether, as a matter of fact, human tuberculosis is or is not communicable to cattle.

In the meantime, it appears from the facts recorded in the following statement, that difficulty has been experienced in working the Milk Clauses, owing chiefly to the disposal of a number of the affected cows, so that they cannot be traced.

Powers ought to be obtained to secure that cows suffering from tuberculosis of the udder are not disposed of, except for slaughter, and that they are slaughtered under supervision. If the Milk Clauses are to be worked, it is essential to prevent animals producing tuberculous milk either from being sold as dairy cows or from being killed and sold for human food in a condition of advanced disease.

WORK DONE BY THE VETERINARY SURGEON FOR THE SANITARY COMMITTEE DURING THE YEAR ENDING APRIL 30TH, 1901.

I have great pleasure in presenting this Report to the Medical Officer of Health.

During the year my time has been fully occupied (1) inspecting the Manchester cowsheds and dairies as to their compliance with the Manchester Regulations made under the Dairies, Cowsheds, and Milkshops Orders; (2) in carrying out the duties of Veterinary Surgeon in the working of the Milk Clauses contained in the Manchester General Powers Act, 1899. The latter duties comprise the inspection of the cows in the Manchester cowsheds for tuberculosis of the udder, and also of the cows upon farms outside Manchester from which tuberculous milk has been sent into the city by road or rail.

Manchester Cowsheds.

In carrying out the inspection of the cowsheds under the Manchester Regulations, 212 visits have been paid to city farms and 303 inspections of cowsheds have been made. Whilst stating that the majority of the cowkeepers are doing their best to keep their cowsheds, dairies, and premises clean, I have had occasion, in a few instances, to seriously warn the occupiers that greater attention to cleanliness in the cowsheds would have to be given. As in each of these instances at subsequent visits I have found a decided improvement, I conclude that as frequent inspection of the cowsheds as possible is desirable, and that want of cleanliness is often due to carelessness, although in a few instances it is, no doubt, due to a scarcity of labour.

As regards compliance with the regulations relating to dairies and cowsheds, a large number of the Manchester cowsheds fail as regards light, ventilation, cubic contents and superficial space per cow, an impervious floor, proper and efficient drainage, an adequate supply of wholesome water, and middenstead accommodation.

At the cowsheds and premises of seven of the cowkeepers, however, considerable alterations and improvements have been made which will enable the occupiers to comply with the regulations, although in regard to two or three of these the proposed alterations have not been completed, having to be suspended last Autumn owing to the approach of the cold weather. At two or three other cowsheds the owners have promised to improve the sanitary arrangements during this next Summer, and detailed reports of the defects in regard to six others have been prepared ready for drawing up specifications, showing one way of doing what is required to fulfil the regulations. Two new cowsheds have been completed during the year, and are now in occupation. One cowshed has been demolished to make room for street improvements; whilst three of the cowkeepers have ceased to keep milking cows owing to the inability of the owners to carry out the alterations necessary to comply with the regulations.

Four of the cowkeepers have been summoned: three for non-compliance with the regulations, and one for failing to register as a cowkeeper and dairyman. Fines were imposed upon the former, and the latter was adjourned to give the defendant a further opportunity to register. This he took advantage of, and the case was then withdrawn.

Manchester Cows.

The number of Manchester cows examined during the year was 1,579. As will be seen later, there are about 1,100 milking cows kept in the Manchester cowsheds, but as in many of the cowsheds they are changed about every

eight or nine months, it is improbable that many of the same cows were examined on more than one occasion, although in some cases the examination was, no doubt, repeated.

The majority of the Manchester cows are kept in a very clean state, although there have been, in a few instances, exceptions to this. Simply drawing the cowkeeper's attention to this has, however, always been sufficient to improve the conditions. Where the cowsheds are overcrowded and the floor in bad order, it is much more difficult for the occupiers to keep the cows clean, and these defects necessitate additional labour in grooming and a greater quantity of bedding.

In only one instance did I see the cows in what may be called poor condition, indicating that they were somewhat underfed. The rule is certainly to feed the cows well, to get a good supply of rich milk from them, and at the same time prepare them for the butcher.

As will be seen later, seven city cows have been found suffering from tuberculosis of the udder, and in one other instance the owner was advised to remove from his cowshed a cow which was far advanced with generalised tuberculosis, and the carcase of which, after slaughter at the Water Street Abattoirs, was condemned by the Meat Inspector.

One of the city cowkeepers was prosecuted for failing to notify in writing to the Medical Officer of Health the presence in her dairy of two cows having well-marked tuberculosis of the udder, a fine being imposed.

As the result of some correspondence between the Local Government Board and the Medical Officer of Health relative to the amount of cubic space per cow required in the city cowsheds to comply with the Manchester Regulations under the Dairies, Cowsheds, and Milkshops Orders, an inquiry was instituted among the city cowkeepers relating to the housing and feeding of their milking cows, the length of time when their cows are out at grass or at water, together with the acreage of grass land in their occupation, and whether used for grazing or mowing purposes.

The results of these inquiries are contained in the following :—

*Summary of Particulars re The Housing and Grazing of Milking Cows
in the Manchester Dairies.*

The total number of dairies situate within the city boundaries at which cows are kept for the production of milk is 77. From 75 of these the milk is sold within the city. Two of the dairymen do not sell milk in Manchester, one taking his milk to Oldham and one to Middleton.

In October, 1900, returns were obtained from 67 of the Manchester cowkeepers, giving details as to the acreage of land attached to each holding, the number of acres for grazing and mowing respectively, and the conditions generally under which the milking cows are housed and grazed.

From these returns it appears that there are only three of the Manchester City cowkeepers who hold no land upon which to turn their cows out to grass. All the remainder either have land attached to their cowsheds or have land under separate tenancies at no great distance from their cowsheds.

The total number of acres of land thus occupied in connection with the 67 dairies from which returns were obtained is 2,123, of which 968 acres are stated to be used for hay growing and 1,155 are used for grazing purposes. It should be pointed out that several of the dairymen graze horses upon their land in addition to their milking cows.

Sixteen of the cowkeepers have no land for growing hay-grass. These have to buy all the hay consumed by their cows, whilst a number of others have to buy a large proportion of their hay. The latter condition is most general among the cowkeepers living nearest to the centre of the city. With the exception of the three previously mentioned as holding no land, all the cowkeepers graze their cows for some period during the summer. This period in no case exceeds six months, and in only two instances does it reach to that, and then only when the Spring and Autumn are exceptionally favourable as regards the weather.

The majority of the cowkeepers only graze their cows during the months of June, July, August, and September. In 17 cases the cows are only then turned out to grass in the daytime, and in many others the cows are only out in the fields at night when the weather is exceptionally warm. At about half of the city cowsheds only are the cows out both night and day during the whole of the time that they are out at grass, that is, June to September.

In addition to turning their cows out to grass during the summer months, only a very few of the Manchester cowkeepers turn their cows into the fields daily during some portion of the remainder of the year, not in more than five or six instances, and then only on very fine days in the Spring and Autumn.

The majority of the cowkeepers consider the climate too cold to turn their cows out daily for exercise, although in most instances the cows are turned into the yard for five or ten minutes once or twice daily for watering purposes.

The latter procedure is, however, not invariable, as a few of the cow-keepers, those generally who have the most stuffy cowsheds, object to turning their cows out of the cowsheds during the cold weather at all, stating that they consider it dangerous to the health of their cows to do so.

In every instance when the cows are out at grass, additional food, generally in the shape of meal and cake, is supplied twice daily, at milking times. When the cows are not at grass, of course, all their food is supplied in the cowsheds.

The total number of cows kept by the city cowkeepers for the production of milk is about 1,100.

Manchester Milk Clauses.

The Manchester Milk Clauses are embodied in the Manchester General Powers Act, 1899, and were given in the Annual Report for 1898.

The same method of procedure under the clauses has been continued during the year as was set out in the Annual Report for 1899, and is shortly as follows:—Samples of the milk supplied to Manchester by rail or road conveyance are taken at the Manchester railway stations or elsewhere by the Food and Drugs Inspectors. These samples are submitted to Professor Delépine for bacteriological examination. All samples reported tuberculous by him are followed up to the farm by the representative of the Medical Officer of Health and the Veterinary Surgeon. The Veterinary Surgeon examines all the milking cows at the farm, and takes special samples from all cows having diseased or suspicious udders. These are also examined by Professor Delépine, and in this way the fact of a particular cow having a tuberculous udder is definitely proved. Samples from cows found to have diseased or suspicious udders by clinical examination, without previous station samples, are examined in the same way.

Tuberculous Milks.

As a result of inspecting 1,579 cows in the Manchester cowsheds, seven were found to be suffering from tuberculosis of the udder, equal to 0·44 per cent. Five of these were slaughtered at the Water Street Abattoirs, three of the carcasses being condemned as unfit for human food, and two being passed. The owners of the remaining two elected to isolate their cows, to gradually dry them off, and fatten for slaughter. Both owners have, however, given a definite promise not to sell their diseased cows except for immediate slaughter, and to notify the Medical Officer of Health when ready for slaughter, so that he can arrange for the Veterinary Surgeon to be present at the time.

At the cowsheds just outside Manchester, the occupiers of which send their milk into the city by cart, 66 cows were examined, one of which was found to have a tuberculous udder, equal to 1·5 per cent. Before the result of examining the diseased cow's milk could be reported by Professor Delépine the owner left the neighbourhood, and, except that the cow had been sold, no information as to her disposal could be ascertained.

Four hundred and ninety-nine cows have been inspected at country farms without previous samples being taken at the railway stations, with the result that three were found to have tuberculous udders, equal to 0·6 per cent. Two of these were slaughtered in my presence, one being fit for human food, one unfit; and as regards the third, the owner wrote stating that he had killed the diseased cow and buried her.

During the year samples have been taken at the Manchester stations from the milk cans belonging to 295 farmers. Of these farmers, 199 live in Cheshire, and 32 of them (16·08 per cent.) sent tuberculous milk; 30 live in Staffordshire, and one of them (3·33 per cent.) sent tuberculous milk; 57 live in Derbyshire, and three of them (5·26 per cent.) sent tuberculous milk; whilst three live in Salop and 5 in Lancashire, from which two counties no tuberculous milk was discovered to have been sent to Manchester.

It will thus be seen that of the milk sent by rail to Manchester from 295 farms, the milk from which was tested, that from 36 of them (equal to 12·2 per cent.) was tuberculous.

From returns supplied by the farmers themselves to the Public Health Office, the estimated number of cows at these 295 farms is 6,348 (equal to 21 cows per farm), and in following up the 36 tuberculous station samples I have examined the udders of 1,148 of these cows. The number of cows having undoubted tuberculous udders (the milk from which was examined by Professor Delépine and found to produce tuberculosis in test animals) is 27, and these were found at 25 farms. At each of two farms two cows with tuberculous udders were found. At five of the 36 farms no cows having tuberculous udders could be found, although in each instance the farmer admitted selling cows which were in some way diseased, though he did not admit that he knew any cow sold to have a tuberculous udder. In these five instances control samples of the milk were taken for examination, with a negative result in each case, showing that the previous source of infection had been removed. In regard to the remaining six farms out of the 36, samples of milk from suspicious cows are still in process of examination by Professor Delépine. On 4 of these farms 5 cows with tuberculous udders have been found, while on two no tuberculous udders were discovered.

To give the percentage of cows having tuberculous udders among the cows represented on the 295 farms from which the milk sent into Manchester by rail was tested, it will be necessary to strike out the five farms where no cows with tuberculous udders could be found, and also the six farms from which the milk from suspicious cows is still under investigation. We shall then have the average number of cows represented as $\frac{25}{36}$ ths of 6,348, equal to 4,405, but as 27 cows with tuberculous udders were found at the 25 farms, the percentage has to be reckoned on this basis, and comes out 0·61 per cent.

Or, if we take the total number of cows with tuberculous udders, 38, and the average number of cows the milk from which was tested, 4,405, *plus* the total number of cows examined irrespective of previous mixed samples, 2144, or a total of 6,549, we have a percentage of cows with tuberculous udders of 0·58, which is not far from 0·61, the percentage given above.

As to the disposal of the 27 cows with tuberculous udders, the ascertained particulars are as follows :—4 have been slaughtered, and found fit for human food ; 8 have been slaughtered, and found unfit for human food ; 4 have been fed by the owners, and are stated to have been sold as fat animals for slaughter, but as no particulars as to sale were given beforehand, the sale or slaughter of them cannot be verified ; 6 have been removed from the farms by the owners, and their ultimate destination cannot be traced ; whilst 5 are stated to be still in the possession of their owners, and are being fed for slaughter. Three out of these five owners have promised to ultimately have the diseased cows slaughtered, and to notify the Medical Officer of Health as to the date, hour, and place of slaughter, so that his representative can arrange to be present and to examine the carcase.

Altogether, five prosecutions have been taken under the Manchester Milk Clauses. These have been against farmers who have failed to give written notice to the Medical Officer of Health for Manchester regarding the presence in their dairy herds of cows having well-marked tuberculosis of the udder. Four of these farmers live in Cheshire, and one is a city cowkeeper. Fines of twenty shillings and costs were imposed in three of the cases, whilst two were dismissed, on the ground that the presence of Professor Delépine was necessary to prove that the udders were tuberculous.

Appended are particulars re the Disposal of all Cows having Tuberculosis of the Udder—viz., 47 Cows found at 41 Farms—between the dates January 11th, 1900, and April 30th, 1901.

No. 1.—This cow was discovered on January 25th, 1900, by clinical examination ; the diagnosis being verified by the bacteriological examination of the milk by Professor Delépine. The owner was written to by the Medical

Officer of Health, and seen twice by the Veterinary Surgeon. The desirability of slaughtering the diseased cow was pointed out to the owner, and he agreed that this should be done. The animal was slaughtered on March 7th at the Water Street Abattoirs, and the carcase, after examination and removal of the diseased parts, was passed as fit for human consumption by Mr. Holburn.

No. 2.—This is a very similar case to No. 1 as to finding the cow, which was discovered on January 31st, 1900. The owners were written to by the Medical Officer of Health, and seen on two occasions by the Veterinary Surgeon. The desirability of slaughtering the diseased cow was pointed out to them, but they preferred selling the animal to a dealer, which they did. The dealer sold the cow on February 20th in Salford Cattle Market to a Liverpool dealer.

No. 3.—The cow at this cowshed was also discovered by clinical diagnosis on February 6th, 1900, and the tuberculous condition of the udder was proved by bacteriological examination of the milk by Professor Delépine. The owner was written to by the Medical Officer of Health and seen by the Veterinary Surgeon. The badly diseased and very emaciated condition of the animal was pointed out to the owner, who at once determined to send the animal to the knacker's yard at Stockport, where it was slaughtered on February 20th in the presence of the Veterinary Surgeon.

No. 4.—This cow was discovered in consequence of a previous station sample taken on January 18th being tuberculous. The Veterinary Surgeon visited the farm and pointed out the diseased cow to the owner, who at once sent the cow to be sold for slaughter at Crewe Auction Mart. The farmer informed the Veterinary Surgeon later that the cow had been disposed of in this manner.

No. 5.—Two cows having tuberculous udders were discovered on this farm by the Veterinary Surgeon on May 10th, 1900, when visiting on account of previous station samples being tuberculous. The owner was written to by the Medical Officer of Health, who pointed out that the diseased condition of the udders of the two cows had been verified by the bacteriological examination of the milk from each. The farm was also visited by the Veterinary Surgeon.

As the farmer had not received the Milk Clauses previous to the first visit of the Veterinary Surgeon, copies were left with him, and the clauses relating to isolation, selling of diseased milk, and notification were pointed out to him. The owner elected to isolate his diseased cows and feed them for slaughter, at the same time promising to notify the Medical Officer of Health as to the ultimate disposal of the diseased cows. This promise, however, was not carried out until some time after the cows had been sold—a delay which

prevented any definite knowledge of the final disposal of the diseased cows being obtained. The sale of the cows took place on the 18th and 19th of June.

No. 8.—This cow was discovered on May 31st by the Veterinary Surgeon when visiting the farm in consequence of an infected station sample, but only after a second visit, the mixed milk taken at the station having been a second time shown to contain tubercular bacilli. Three letters were sent to this farmer by the Medical Officer of Health—the first pointing out the identity of the diseased cow; the second suggesting that as the Veterinary Surgeon was of opinion that the cow, if slaughtered at once, would probably be fit for human consumption, it would be best to kill the cow as soon as possible; the third was sent owing to no reply being received after the second letter. The owner then arranged to have the cow slaughtered at Knutsford, which was done on July 16th, and the carcass seen by the Veterinary Inspector. The carcass was well nourished and of a good colour, but as there was extensive recent disease on the pleura and peritoneum, the Veterinary Surgeon advised that the local Medical Officer of Health be asked to inspect the carcass. This was done, and the carcass condemned.

No. 10.—The diseased cow at this farm was discovered on March 21st at a visit of the Veterinary Surgeon subsequent to the taking of a previous infected station sample. The condition of the cow's udder was pointed out to the farmer, and it afterwards transpired that he took the diseased cow to the Auction Mart and sold her on the third day after the visit of the Veterinary Surgeon. Enquiries from the Auctioneers only elicited the reply that the cow was sold to a Mr. Bayley, with address unknown.

No. 12.—Two cows having tuberculous udders were found here on March 30th by the Veterinary Surgeon when visiting the farm to investigate a previous sample of poor milk. Samples of milk from the diseased cows were reported positive by Professor Delépine. Three days after the Veterinary Surgeon's visit the owner sold one of the cows, and wrote informing the Veterinary Surgeon of the fact, but did not give the name of the buyer then, nor afterwards in response to a telegram from the Medical Officer of Health or to a letter sent by the Veterinary Surgeon the same day.

A month later (May 4th) the farm was visited again by the Veterinary Surgeon, when the owner informed him that the first cow had been sold for slaughter. The second cow was then showing signs of ill-health, but was isolated and being dried. The owner promised to notify the Medical Officer of Health when he sold the cow, a promise which was not kept, as it afterwards transpired that he sold the cow for slaughter about a week later, a fact which was only discovered by his reply to a letter sent by the Medical Officer of Health some time afterwards.

No. 13.—This cow was discovered by clinical examination on April 2nd, the diagnosis of the Veterinary Surgeon being verified by the examination of the milk by Professor Delépine.

The presence of this cow was reported to Dr. Garstang, who wrote to the Medical Officer of Health on May 4th stating that she had been removed and slaughtered. The farm was also visited on May 3rd by the Veterinary Surgeon, when the owner informed him that he had sold the cow to a pig dealer at Knutsford.

No. 16.—The diseased cow on this farm was found on May 9th by the Veterinary Surgeon when visiting on account of a previous infected station sample. The bacteriological examination of the cow's milk by Professor Delépine established the diagnosis, and the owner was then written to by the Medical Officer of Health acquainting him of this fact, and suggesting that it would probably be to his (the owner's) advantage to slaughter the cow at once, but mentioning that, if he preferred, it was open to him to isolate the cow, dry her off, and fatten for slaughter, and asking what he proposed to do.

As no reply was received from the owner, a further letter was sent in a week's time, to which the farmer replied that he had isolated the cow, dried her, and was feeding her for slaughter. A letter was then sent by the Medical Officer of Health, asking the owner to inform him when the cow was sold, and to give the name and address of the buyer. A stamped addressed envelope was enclosed for reply.

Receiving no reply from the farmer for more than three months, the Medical Officer of Health again wrote to him requesting information as to the disposal of the cow, and receiving no reply sent a second letter three days later. The following day a reply came, stating the cow had been sold to a cattle dealer "some time ago."

No. 17.—This cow was discovered by clinical examination on May 17th, the diagnosis of the Veterinary Surgeon being verified by Professor Delépine's bacteriological examination of the milk, and also of the pus from an abscess in the udder. A second visit was made by the Veterinary Surgeon, when the owner at once agreed to have the cow killed at the Manchester Abattoirs. This was duly carried out on June 21st, the carcase being condemned.

No. 18.—Following up a previous infected station sample, the Veterinary Surgeon visited this farm on June 18th and pointed out one cow, which was nearly fat, as having a very suspicious udder. A sample of milk was taken and submitted to Professor Delépine for examination, the inoculation result being positive. Four days after the visit of the Veterinary Surgeon, a post-card was received stating that the cow had been sold for slaughter to a butcher at Stockport.

No. 19.—The diseased cow at this farm was discovered by clinical examination on May 28th, the diagnosis being verified by Professor Delépine's examination of the milk. The Veterinary Surgeon's visit was in connection with the Monsall Hospital milk contract. A second visit was made by the Veterinary Surgeon on June 27th, when the owner promised to isolate the cow, dry her, and feed for slaughter. The Medical Officer of Health then wrote to the owner, stating that if he fed the cow he must isolate her, but that it would probably be to his advantage to slaughter the cow at once and save his feed, and also asking for the date, time, and place when she would be slaughtered. In reply the owner stated that the cow was isolated, and being dried for feeding, but that "if not shaping to feed well he would sell her without," but giving no promise to inform the Medical Officer of Health what his final decision would be. The Medical Officer again wrote to the owner that it would be only satisfactory if the cow was sold for slaughter, asking for a final decision, and for a promise to notify the date, time, and place of slaughter, so that the Veterinary Surgeon should have an opportunity of inspecting the carcase. A post-card was received in reply which was unsatisfactory, the owner wanting to sell the cow at a local auction. The owner was again written to by the Medical Officer of Health, and then he replied that he would sell the cow for slaughter, if at all, and give the name and address of the buyer. However, previous to this the matter was also laid before Dr. Vacher, who communicated with Dr. Gough, the local Medical Officer of Health. What was wanted was either that the cow should be slaughtered, or some guarantee obtained from the owner that she should not be sold as a dairy cow. By Dr. Gough the matter was brought before his District Council, with the result that a week later, July 12th, the owner wrote to say the cow had been slaughtered and buried. No information was given which would enable the Veterinary Surgeon to be present at the time of slaughter.

No. 20.—On his following up a previous tuberculous station sample, a suspicious cow was discovered by the Veterinary Surgeon on July 10th, on which date he visited the farm. An examination of the milk by Professor Delépine showed the udder to be tuberculous, and then the identity of the diseased cow was made known to the owner by a letter from the Medical Officer of Health, which, while pointing out that the cow could be isolated and fed for slaughter, stated that it would probably be best to have her slaughtered immediately, and asking for information as to the date of the sale or slaughter of the cow, so that the Veterinary Surgeon should be able to be present. As no reply was received for three weeks, the Medical Officer of Health wrote to the owner that he must lay the matter before the Committee, to which the owner replied on September 17th that the cow had been sent to the bone works, and that he had reported

this to the local Medical Officer of Health, who, however, did not communicate with the Medical Officer of Health for Manchester for some months, and then only in a casual way, when writing *re* another cow.

No. 21.—The Veterinary Surgeon discovered this cow on July 25th by following up a previous tuberculous station sample, the diagnosis being verified by Professor Delépine's microscopical examination of the milk. In the absence of the Medical Officer of Health, the owner was written to by the Veterinary Surgeon, asking that the cow be isolated and her milk kept back from sale. A reply was received stating that this should be done. As a result of two letters from the Medical Officer of Health, the owner arranged to have the diseased cow slaughtered, which was done on August 15th, in the presence of the Veterinary Surgeon and Mr. Sadler, at Dunham Hill. The carcass was buried.

No. 22.—Two diseased cows were discovered on this farm at a visit of the Veterinary Surgeon on June 19th in response to a notification sent by Mr. Sadler, the diagnosis being verified by Professor Delépine's examination of the milk. The owner was informed of this in a letter sent by the Medical Officer of Health, and he elected to isolate, dry, and feed the cows for slaughter.

When the cows were ready for slaughter, Mr. Sadler wrote to the Medical Officer of Health to this effect, and on behalf of the owner pointed out certain difficulties in the way of the Veterinary Surgeon making a post-mortem examination of the carcasses. These were, shortly, that if the cows were sold by private treaty the buyer would have to be informed, and this would certainly prejudice the sale; whereas if the animals were sold by public auction there would be a difficulty in following the diseased cows to their destination, and the buyer or buyers might object to the carcasses being inspected.

In reply to Mr. Sadler's letter, the Medical Officer of Health stated that the animals ought not to be sold in open market even for slaughter unless there was some security for skilled inspection of the carcasses, but that if the owner would arrange to have the cows slaughtered the Veterinary Surgeon should be present. A few days later Mr. Sadler wrote that although he and the owner did not see any reason why the cows should not be sold in open market, simply because they had tuberculous udders, and although they did not recognise the right of the Medical Officer of Health to insist on a special veterinary examination, still, to facilitate the work of the Medical Officer of Health, the owner had arranged with a local butcher to slaughter the cows on his own premises, and that the Veterinary Surgeon could arrange to be present at the time and make any investigation he might desire, but that the owner

would reserve to himself the right to dispose of the carcasses as he thought fit (if good for food he would send them to market, if not he would bury them), and take the responsibility.

The two diseased cows were shortly after (October 2nd) killed in the presence of the Veterinary Surgeon. The one cow, a young one, was well fed, and when killed was found to be only slightly affected with tuberculosis. All the diseased parts were carefully removed by the butcher—this carcass was fit for human consumption. The second cow was an old one, and had not put on flesh during the time the owner had kept her since drying off. When slaughtered the carcass was found extensively diseased, and was not fit for human consumption. The owner stated that he would bury the carcass.

No. 23.—Following up previous tuberculous station samples, the Veterinary Surgeon visited this farm on July 26th, but could not discover any cow having a typical tuberculous udder. A sample of mixed milk was taken and submitted to Professor Delépine, who reported it tuberculous. The Veterinary Surgeon on October 1st again visited the farm, and discovered the cow having a tuberculous udder, a sample of milk from which was declared tuberculous by Professor Delépine. At the same visit 25 milking cows were tested with tuberculin, and only five cows passed the test. Before allowing his cows to be tested, however, some three letters had to be sent to the owner by the Medical Officer of Health, and the matter had to be placed before the Hospitals Sub-Committee to consider the advisability of stopping the farmer from supplying milk to Manchester. The farmer then had an interview with the Veterinary Surgeon, and also wrote to the Medical Officer of Health, stating that he would allow the cows to be tested.

After the receipt of Professor Delépine's report of his examination of the special sample of milk from the diseased cow, the Medical Officer of Health wrote to the owner acquainting him with the positive result of the examination, and, while mentioning that it was usually to the farmer's own advantage to have such cows slaughtered at once, pointed out that it was also open to him to isolate, dry off, and feed the diseased cow. The farmer replied that the latter was being carried out, and then the Medical Officer of Health wrote asking for an opportunity for post-mortem examination of the carcass of the cow when slaughtered. The matter was also reported to Dr. Vacher and Dr. Bennett.

A few days later a letter was received by the Medical Officer of Health from Mr. Sadler, writing on behalf of the farmer, and asking if there was really any necessity for special inspection at the time of slaughter, as it would be extremely inconvenient, and might mean considerable loss to the farmer, who preferred selling the cow when fat in Crewe Market.

The Medical Officer of Health wrote in reply that it was absolutely necessary to have skilled inspection of such carcasses, as the disease was usually extensive, and that after the experience with Mr. Shaw's roan cow fresh safeguards or fresh legislation would be required. Further, that he could not agree to any relaxation in regard to the necessity for inspection of a cow with a tuberculous udder, and suggested that the cow should be killed at the Manchester Abattoir, where full value would be obtained, unless the carcase was bad, according to the standard of the Local Government Board.

A letter was then received from Mr. Sadler, expressing his regret that the Medical Officer of Health could not see his way to comply with the farmer's requirements, and stating that he (Mr. Sadler) could not see that the Medical Officer of Health had any right, legal or otherwise, to insist that the farmer should have the cow slaughtered under his inspection.

The matter was then reported to the Hospitals Sub-Committee, who resolved that the farmer be requested to notify the time and place of slaughter of the diseased cow. This request was made to the farmer, but was not complied with. On January 8th, 1901, Dr. Bennett, Medical Officer of Health, Sandbach, wrote stating that he had incidentally been informed that the diseased cow had been sold and killed about three weeks before, but that he had received no information from the farmer.

No. 24.—The cow was discovered at this farm by the Veterinary Surgeon, on July 30th, following up a previous tuberculous station sample, the diagnosis being verified by Professor Delépine's examination of the milk from the diseased cow. The owner was then written to by the Medical Officer of Health, who suggested slaughter of the diseased cow, and pointed out the liability to prosecution for failing to notify. The matter was reported to the Hospitals Sub-Committee, and a prosecution followed. Previous to the latter, however, the owner's solicitor wrote stating that the diseased cow would be slaughtered at a certain time and place, thus affording an arrangement for examination of the carcase being carried out. The slaughter was witnessed on October 31st by the Veterinary Surgeon and Mr. Holburn, and the two fore-quarters of the carcase were condemned.

No. 25.—This cow was discovered by Mr. Holburn on August 29th when following up a previous tuberculous station sample. A sample of the milk was reported by Professor Delépine to contain tubercle bacilli. Two letters were sent to the owner by the Medical Officer of Health, and the former wrote agreeing to have the cow slaughtered, stating the time and place. This was carried out on October 11th in the presence of the Veterinary Surgeon. The carcase, being unfit for food, was at once sent to the bone works at Macclesfield.

No. 26.—This cow was discovered by the Veterinary Surgeon on September 17th while following up a previous tuberculous station sample, the diagnosis being verified by Professor Delépine's examination of the milk. Two letters were sent by the Medical Officer of Health to the owner suggesting slaughter of the diseased cow, and asking for such information as would enable the Veterinary Surgeon to be present at the time and place of slaughter. The owner agreed to this, and stated that it should be carried out at the premises of Mr. ———, horse slaughterer, Macclesfield. This was done on October 30th in the presence of the Veterinary Surgeon, and the carcase was sent to the bone works at Macclesfield.

No. 27.—This cow was discovered by the Veterinary Surgeon on September 20th while following up a previous tuberculous station sample, the diagnosis being confirmed by the examination of the milk by Professor Delépine. The owner was advised of this by a letter sent by the Medical Officer of Health, which at the same time suggested that the cow should be slaughtered. The owner did not agree to this, but stated that the cow was isolated and dried. No promise as to the slaughter of the cow was given. The matter was laid before the Hospitals Sub-Committee, and a prosecution followed, the summons being dismissed on the ground that Professor Delépine's presence was necessary to complete the evidence.

No. 29.—This cow was discovered by the Veterinary Surgeon on September 20th while following up a previous tuberculous sample, a sample of the milk being reported by Professor Delépine to contain tubercle bacilli. A letter was sent to the owner by the Medical Officer of Health, and the former at once agreed to slaughter the cow on his own premises. This was done on October 12th in the presence of the Veterinary Surgeon. The carcase was a good one, and very slightly diseased; it was afterwards sold to a local butcher for £8.

No. 30.—Two diseased cows were discovered on this farm on September 24th by following up a previous tuberculous station sample. Samples of the milk from each cow were submitted to Professor Delépine, and these confirmed the diagnosis of the Veterinary Surgeon, one by the microscopic and one by the inoculation test. The owner was written to by the Medical Officer of Health, advising that the cow should be slaughtered, and pointing out his liability for not notifying the case. The owner replied that the cow was isolated, and being dried. The Medical Officer of Health again wrote, stating that as he was informed by the Veterinary Surgeon that the cow was probably far advanced in disease it would not pay to feed, and consequently the best course was to slaughter immediately. The owner then agreed to slaughter the cow providing no further action was taken against him. This was carried out on

October 31st in the presence of the Veterinary Surgeon. The carcase was quite unfit for human food, but it afterwards transpired that the butcher who killed the cow had sent three-quarters of the carcase to Manchester.

Previous to this, however, the final report of Professor Delépine had been received, showing that the sample from the second cow was capable of causing tuberculosis. A letter was written to the owner by the Medical Officer of Health intimating this, but no reply was received until six days later, when the owner replied stating that the cow had been sold. Later he informed the Veterinary Surgeon verbally that the cow was sold to his father, and it was subsequently ascertained that she had been again sold by the father, but no name of the purchaser was given, and no further information could be obtained.

No. 31.—This cow was discovered by clinical examination on October 9th, a sample of milk being reported by Professor Delépine to be tuberculous. The owner was afterwards seen by the Veterinary Surgeon, and he agreed to have the cow slaughtered at the Manchester Abattoirs. This was done on November 21st, and the carcase, when examined by Mr. Holburn, was condemned.

No. 32.—Two cows having tuberculous udders were discovered on this farm by the Veterinary Surgeon on November 6th. The owner at once made arrangements to have them slaughtered at the Manchester Abattoirs, and this was done on November 8th in the presence of the Medical Officer of Health and Veterinary Surgeon. The carcasses were also examined by Mr. Holburn, one being passed, the other condemned.

No. 33.—Following up a previous tuberculous station sample, the Veterinary Surgeon on December 11th, 1900, visited this farm, but could not find any cow exhibiting signs typical or suspicious of tuberculosis of the udder. A control sample of the milk was then taken, and this was reported by Professor Delépine as having caused tuberculosis. The farm was again visited by the Veterinary Surgeon on January 17th, 1901, when he discovered a young black cow, which was nearly fat, having a small patch of induration in one quarter of her udder. A sample of milk was taken from this cow, and was reported by Professor Delépine to contain tubercle bacilli. The owner was then written to by the Medical Officer of Health, advising that the cow should be slaughtered. A reply was received on January 26th, 1901, that the cow had been sold in a fat stock auction mart at Macclesfield a week previous. The name of the buyer could not be ascertained.

No. 36.—A cow having a tuberculous udder was discovered at this farm on December 18th by the Veterinary Surgeon when visiting in consequence of a station sample being reported tuberculous. A sample of milk from the diseased udder was reported by Professor Delépine as having caused tuberculosis. The

owner was then written to by the Medical Officer of Health, advising that the cow should be slaughtered, and the owner replied that he preferred to fatten the cow first and then sell her for slaughter. He gave no promise to notify the date, time, and place of slaughter, and did not reply to a further letter sent to him by the Medical Officer of Health. Two months later the farm was again visited by the Veterinary Surgeon, when the owner informed him that the cow had fed well, and that he had sold her three weeks before in Crewe Cattle Market as a fat beast for slaughter, and that he did not know who had bought her.

No. 37.—This cow, having a tuberculous udder, was discovered by the Veterinary Surgeon on December 21st when following up a previous tuberculous station sample. A sample of milk taken by the Veterinary Surgeon from the diseased udder was reported by Professor Delépine to have caused tuberculosis, and the owner was then written to by the Medical Officer of Health, advising that the cow should be slaughtered. As the cow was close to calving the owner objected to that, and elected to first calve the cow, then dry her, and fatten for slaughter. In reply to a further letter from the Medical Officer of Health, he gave a written promise to notify to the former when the cow was ready to kill.

No. 39.—This cow was discovered by the Veterinary Surgeon on December 19th when visiting the farm in following up a previous tuberculous station sample. A sample of milk from the suspicious udder was taken by the Veterinary Surgeon, and this was reported by Professor Delépine to have caused tuberculosis. The owner was then written to by the Medical Officer of Health, advising that the cow should be slaughtered, and he was also seen by the local Medical Officer of Health. As a result, the owner wrote stating that the cow would be slaughtered on January 30th, and this was carried out in the presence of the Veterinary Surgeon, who examined the carcass. The latter was fit for food, and was remarkable for the small amount of generalized tuberculosis, considering the diseased condition of the udder.

No. 40.—This cow was discovered on December 7th by following up a tuberculous station sample. The Veterinary surgeon visited the farm and took a sample of milk from the diseased udder. This was examined by Professor Delépine, who reported that it had caused tuberculosis. The owner was then written to by the Medical Officer of Health, advising that the cow, which was a very old one and badly diseased in the udder, should be slaughtered. This the owner at once agreed to, and the cow was slaughtered on February 7th in the presence of the Veterinary Surgeon. The carcass was not dressed for human food, being quite unfit, and was subsequently buried.

No. 43.—This cow was discovered by the Veterinary Surgeon on January 3rd, 1901, when visiting the farm in consequence of a previous

tuberculous station sample. A sample from the diseased udder was reported by Professor Delépine to have caused tuberculosis. The owner was then written to by the Medical Officer of Health, advising that the cow should be slaughtered, and in reply a letter was received stating that the cow had been sold for slaughter a week before to a Mr. ———, of Knutsford. A letter from the Medical Officer of Health to Mr. ——— elicited no reply, and consequently the slaughtering of this diseased cow could not be verified.

No. 44.—This cow was discovered on January 8th, 1901, by following a tuberculous station sample. A sample taken from the diseased cow's udder by the Veterinary Surgeon was reported by Professor Delépine to have caused tuberculosis. The owner was then written to by the Medical Officer of Health, advising that the cow should be slaughtered, but the former would not agree to this, electing to isolate and dry off the cow, and then fatten for slaughter. The cow was still in the possession of the farmer on April 17th, on which date he was prosecuted for failing to notify the presence of a tuberculous cow on his farm, and fined twenty shillings and four guineas extra costs.

No. 46.—This cow was discovered by the Veterinary Surgeon on February 28th, 1901, when visiting the farm in following up a previous tuberculous station sample. The nature of the diseased condition of the udder was pointed out to the owner by the Veterinary Surgeon, who also took a sample of the milk from the diseased udder. This was reported by Professor Delépine, firstly, to contain tubercle bacilli, and, secondly, to have produced tuberculosis. The owner was written to by the Medical Officer of Health, advising him that the diseased cow should be slaughtered, when a letter was received from the owner's agent stating that the cow had been sold for slaughter on March 9th. Further enquiries elicited the information that the cow had been sold to a Mr. ———, and that he had again sold her to an unknown buyer in Crewe Auction Mart. Further than that it was impossible to trace this cow, and it is not known whether she has been slaughtered or not.

No. 47.—Two cows having tuberculous udders were discovered at this farm by the Veterinary Surgeon on March 7th, 1901, while visiting in consequence of a tuberculous station sample. Samples of milk were taken from the diseased cows, and were reported by Professor Delépine to have caused tuberculosis. The owner was then written to by the Medical Officer of Health, advising that the diseased cows should be slaughtered, when the owner replied on April 16th, 1901, that he had isolated the cows, and was drying them off previous to grass feeding them for slaughter. When fat he would advise the Medical Officer of Health, so that their slaughter or ultimate disposal could be verified.

No. 48.—The diseased cow at this farm was discovered by the Veterinary Surgeon on January 31st, 1901, by clinical examination. A sample of the milk from the diseased udder was also reported by Professor Delépine to have caused tuberculosis. As a result of a second visit to the farm by the Veterinary Surgeon the owner called to see the Medical Officer of Health on March 6th, and decided to isolate the cow and feed her for slaughter, at the same time giving a written promise to notify the Medical Officer of Health as to the date, hour, and place of slaughter, so that the slaughter of the cow could be witnessed by the Veterinary Surgeon and the carcass examined. At a subsequent visit on July 17th the Veterinary Surgeon was informed that the cow had been removed to another farm owing to lack of convenience for isolation, but that she had only been there a few days when she was found dead in her stall, and the carcass disposed of before the owner knew of her death.

No. 50.—This cow was discovered by the Veterinary Surgeon on March 12th, 1901, when visiting the farm in following up a previous tuberculous station sample. A sample of milk was taken by him from the udder of the diseased cow, which was reported by Professor Delépine to have caused tuberculosis. The owner was then written to by the Medical Officer of Health, advising that the diseased cow should be slaughtered. The owner was also seen by the local Medical Officer of Health. A letter was then received by the Medical Officer of Health stating that the cow would be slaughtered at Knutsford on the 19th or 20th of April. On the 19th a telegram was received from the owner changing the date to the 23rd of April, and on the 22nd a letter was received from him stating that Mr. Sadler would visit the farm on the 23rd to see the cow, and that after his visit he (the owner) would write again giving a final decision. This further letter was sent on the 23rd by the owner to the Medical Officer of Health, stating that he had reconsidered the slaughtering of the cow, and had decided for the present to isolate the cow, dry her off as quickly as convenient (in the meantime undertaking not to sell her milk in Manchester or elsewhere), then to feed her, and when fit for slaughter to advise the local Medical Officer of Health so that he could inspect the carcass; also undertaking not to offer her for sale in a public market or as a dairy cow, but would see that she was sold for slaughter only.

This cow was slaughtered on May 8th in the presence of the Veterinary Surgeon. There was considerable disease on the pleuræ, and in consequence the fore-quarters of the carcass were condemned. The hind-quarters, being free from disease, were passed as fit for human food.

No. 51.—The diseased cow at this farm was discovered on February 12th, 1901, by the Veterinary Surgeon when visiting the farm under the Dairies, Cowsheds, and Milkshops Orders. The cow showed clinical evidence of generalized tuberculosis in an early stage, the udder not being visibly

affected. A sample of milk taken from the diseased cow was reported by Professor Delépine to have caused tuberculosis. The farm was then revisited by the Veterinary Surgeon, and on the following day (March 15th) the owner called to see the Medical Officer of Health, when he was advised to have the diseased cow slaughtered. He, however, would not agree to this, but elected to isolate the cow, dry off, and fatten for slaughter; at the same time agreeing to notify the date, time, and place of slaughter to the Medical Officer of Health, so that the slaughter of the diseased cow could be witnessed by the Veterinary Surgeon and the carcass examined. This cow was slaughtered on August 14th in the presence of two Veterinary Surgeons. The carcass was found to be extensively diseased, and unfit for human food.

No. 52.—The diseased cow at this farm was discovered on February 14th, 1901, by clinical examination when the farm was visited by the Veterinary Surgeon under the Dairy Regulations. A sample of milk from the diseased cow was reported by Professor Delépine to have caused tuberculosis. The owner was then written to by the Medical Officer of Health, advising that the diseased cow should be slaughtered, and he at once made arrangements for this to be carried out at the Water Street Abattoirs on March 30th, when the carcass was examined by Mr. Holburn and the Veterinary Surgeon. The carcass was well fed, and fit for human food.

No. 53.—This diseased cow was found on the farm when visited by the Veterinary Surgeon on March 18th, 1901, in consequence of a previous tuberculous sample which was taken from a milk can belonging to the farmer in Wilmslow Road, Rusholme. A sample of milk from the diseased cow was reported by Professor Delépine to contain tubercle bacilli. The owner was then written to by the Medical Officer of Health, advising that the diseased cow should be slaughtered, and a copy of the letter was also sent to the local Medical Officer of Health. When the latter visited the farm he was informed by the owner that the diseased cow had been sold immediately after the visit of the Veterinary Surgeon to the farm. The name and address of the buyer was communicated by the local Medical Officer of Health to the Medical Officer of Health for Manchester, and, as a result of further enquiries, it could only be ascertained that the diseased cow had been sold to an unknown cattle dealer in Yorkshire. The owner was prosecuted on June 6th for failing to notify the presence of a tuberculous cow on his farm, and was fined 20s. and £2 2s. extra costs.

No. 54.—This cow was discovered at the farm when visited by the Veterinary Surgeon on February 28th, 1901, in response to a notification sent by the farmer to the Medical Officer of Health. This notification was sent four days after a station sample of the farmer's milk had been taken

for examination. A sample was taken from the diseased cow, and both it and the station sample were reported by Professor Delépine to have caused tuberculosis. The owner was then written to by the Medical Officer of Health, advising that the diseased cow should be slaughtered, and asking that the date, time, and place of slaughter should be given, so that the Veterinary Surgeon could arrange to be present. The owner replied that arrangements would be made, and the required information would be given. This information was supplied on the 17th of April, and the cow was slaughtered in the presence of the Veterinary Surgeon on the 19th. The carcass was thin, and the seat of extensive miliary tuberculosis; and, being quite unfit for human food, was destroyed.

No. 55.—This cow was discovered by the Veterinary Surgeon on March 25th, 1901, when visiting the farm in consequence of a previous tuberculous station sample. A sample of milk taken from the diseased udder was reported by Professor Delépine to have caused tuberculosis. The owner was then written to by the Medical Officer of Health, advising that the diseased cow should be slaughtered, and this was carried out in the presence of the Veterinary Surgeon on April 30th. The carcass was well fed, and, the disease being localised, was passed as fit for human food.

J. S. LLOYD, M.R.C.V.S.

OUTBREAK OF ICE-CREAM POISONING.

On the 28th of July, 1900, a large number of cases of violent illness occurred in Salford as the result of the consumption of ice-cream sold from a hand-cart, the property of an ice-cream maker residing in Ancoats. Samples of the incriminated material were submitted to Professor Delépine, who found a very large number of micro-organisms present, even for ice-cream. The state of the premises was very bad indeed, but no worse than in many other instances, and the occurrence appeared therefore to require special explanation. It was ascertained that when the pail containing the mixture was taken out of the house there was a high wind, and a quantity of dust was blown into the pail. It is probable, in addition, that the ice-cream mixture stood in the kitchen, which was not itself clean, until it was partially cold. From the house it was carried into a cellar, into which a door opened from the small yard belonging to the house. It may be assumed that very little, if any, contamination occurred in the cellar. Since this occurrence much attention has been given to the ice-cream-making places, which are now decidedly cleaner than they formerly were.

It is intended gradually to deal with them in the same manner as cellar bakehouses have been already dealt with, those quite unfit for use being closed, and those capable of amendment being altered to specification. It is hoped that the makers of ice-cream will be able to combine to adapt places for common use by a number of makers, or to erect such an establishment.

ON THE OUTBREAK OF ARSENICAL POISONING.

On November 20th, Dr. Reynolds called at the Health Office and informed me that for some months he had had at the Crumpsall Union Infirmary a number of cases presenting fairly uniform symptoms which he had just discovered to be due to the consumption of arsenical beer. Some beer had been already submitted to Prof. Delépine for examination by the Medical Officer of Health for Salford, and both he and Dr. Dixon Mann confirmed from this the correctness of Dr. Reynolds' discovery. Samples of brewing materials were collected from the brewery most implicated, and it was found that arsenic was present in the glucose in large amounts. Dr. Tattersall visited the firm supplying the arsenical glucoses, and obtained samples as well of the manufactured articles as of the materials used in making them, including sulphuric acid. It was thus found that the arsenic had been introduced by the use of sulphuric acid made from pyrites, and which had not been deprived of any of its arsenic.

Circumstances made it necessary for me to carry on a large number of chemical examinations, which consumed much time. Nevertheless, by the aid of my Assistant Medical Officers and Mr. R. M. Rowe, of the Sanitary Department, a sufficient inquiry was made to establish the essential points in connection with the outbreak, while the medical men of the City gave much valuable information, which is embodied in the report presented to the Sanitary Committee.

The Sanitary Committee were, moreover, able to secure a number of convictions against retail dealers, which was the only vindication of the law open to us.

The specific symptoms produced by the consumption of arsenical beer were pain and wasting of the limbs, paralysis, sometimes complete, of the legs or arms, or both, a variety of characteristic eruptions, and in many cases a pigmentation of the skin, sometimes so deep as to simulate that of Addison's disease.

Amongst the important effects produced in varying degrees were interstitial hepatitis (cirrhosis of the liver), œdema of the lower limbs, and dilatation of the right side of the heart. In many instances there was mental hebetude and loss of memory.

It was shown that these latter conditions were not confined to heavy drinkers, though, no doubt, most severe in them.

A sudden increase in deaths occurred in the last half of 1900 in the number of deaths not only from peripheral neuritis, which is the name for the specific affection involving pain, wasting, and paralysis, but from alcoholism and cirrhosis of the liver.

The examinations by Prof. Dixon Mann of organs sent to him by the coroner from the bodies of persons who had died from the disease showed the presence in the tissues of a considerable amount of arsenic. There was, thus, no doubt left as to the causation of death, nor indeed of the symptoms observed in those who did not die.

All the cases which we investigated in which the source of the beer consumed by the patients could be ascertained, to the number of 63, were proved to have drunk beer obtained from breweries which had used the incriminated sugar, and in other ways the evidence was made conclusive by means of our chemical tests. It was afterwards proved that malt in many instances contained arsenic to an extent which could not be recognised as quite safe.

It was established by Dr. Tattersall, and from our own facts, that women suffered much more heavily than men.

From the facts supplied by medical men it was ascertained that over 2,000 persons must have suffered from arsenical poisoning in Manchester.

It is not possible to say how many persons lost their lives by arsenic in 1900, but the number cannot be much under 100. No cases of arsenical poisoning of recent origin have been reported since the beginning of the year. The results of the outbreak in the last half of 1900, however, continue to present themselves. During the first quarter of 1901 there were 15 deaths from peripheral neuritis, 24 from arsenical poisoning, 14 from chronic alcoholism, and 42 from cirrhosis of the liver. The numbers had sunk considerably in the second quarter of 1901. They were : from peripheral neuritis 5, from arsenical poisoning 6, from chronic alcoholism 17, from cirrhosis of the liver 22.

It is unlikely that the same thing will happen again in Manchester, but other oversights in connection with food may well occur, and it would be well, therefore, to consider the known possible sources of danger, and to draw up a tabular list of foods, and of the risks connected with them, for the guidance of the Sanitary Superintendent.

It must be admitted, however, that this is less necessary in Manchester than in most places, since the Acts relating to the Sale of Food and Drugs have always had much, and careful, attention given to them.

The investigation made by Dr. G. S. Buchanan for the Local Government Board showed that though Manchester and Salford were visited with exceptional severity, many other towns, all using Bostock's sugars, had suffered in a similar manner.

The Royal Commission appointed to consider the questions arising out of the outbreak have issued a first report. They recommend that the administrative machinery possessed by sanitary authorities should be improved so as to obviate risk of arsenic or other poisonous substance reaching articles of food and drink in general in some manner to be hereafter specified.

They propose that, meantime, the Board of Inland Revenue shall be made responsible for the prevention of arsenic in brewing materials to an extent exceeding amounts to be specified by them.

BAKEHOUSES.

The following are the particulars of the action taken during 1900:—

BAKEHOUSES ALTERED TO SPECIFICATION.

Address	Date
590, Rochdale Road	May 31st, 1900
24, Embden Street	May 29th, 1900
45, Ellesmere Street.....	May 4th, 1900
255A, Wellington Street	July 7th, 1900
80, Ashton New Road.....	July 7th, 1900
96, Great Ancoats Street.....	July 24th, 1900
138, Chester Road	November 8th, 1900
51, Clayton Street.....	December 21st, 1900

BAKEHOUSES CLOSED DURING 1900.

Address	Date
55, Lower Moss Lane	June 12th, 1900
165, Chester Road	May 15th, 1900
52, Price Street.....	June 1900
111, Queen's Road	July 1900
173, Wilmslow Road	April 5th, 1900
120, Oldham Road	May 1st, 1900
106, Great Ancoats Street	July 10th, 1900
83, Clarendon Street.....	July 28th, 1900
790, Rochdale Road.....	December 17th, 1900
14, Birch Street.....	October 5th, 1900
41, Maskell Street.....	February 18th, 1900
71, Coupland Street.....	November 1900
124, Oldham Road	August 3rd, 1900

STATEMENT OF THE NUMBER OF NEW BAKEHOUSES APPROVED BY THE
IMPROVEMENT AND BUILDINGS COMMITTEE, AND COMPLETED DURING
THE YEAR 1900.

Situation	Date of Approval and Owner	Date of Completion
Bakehouse behind Nos. 190 and 192, Oldham Road, Miles Platting	September 13th, 1899 ; Geo. Beresford	March 10th, 1900
Bakehouse rear of No. 51, Higher Ardwick	February 8th, 1899 ; A. Hailwood	May 9th, 1900
Bakehouse rear of No. 169, Halliwell Lane, Cheetham	January 10th, 1900 ; J. C. Booth	August 15th, 1900
Bakehouse, Wilmslow Road, Rusholme	November 28th, 1900 ; J. and B. Wade	December 28th, 1900

HOUSING OF THE WORKING CLASSES.

This is a question which is at present engaging much attention. A Special Sub-Committee of the Sanitary Committee is considering what lines of action should be followed, and I shall, therefore, for the year 1900 simply give the figures for recent years.

It will be seen that the number of dwelling-houses certified as fit for human habitation were fewer in number in 1900 than in the two previous years.

The principal diminutions have taken place in Cheetham, Harpurhey, and Ardwick. An increase has occurred in Crumpsall, Moston, Bradford, Clayton, and Openshaw, while the large number of houses erected in Rusholme in recent years is sustained.

In the districts adjoining Manchester an increase has taken place in the number of new houses erected, especially in Moss Side and Levenshulme.

A marked diminution occurred in 1900 in the houses condemned as unfit for human habitation. This is due, not to the number of houses unfit for human habitation having been nearly all dealt with, but to the apprehension of the City Council that adequate provision does not exist for rehousing displaced persons. There can be no doubt, however, that there is a large number of empty houses available at the present time.

STATEMENT AS TO THE NUMBER OF DWELLING-HOUSES CERTIFIED AS FIT FOR
HUMAN HABITATION IN THE VARIOUS DIVISIONS OF THE CITY BETWEEN
1890 AND 1900.

DISTRICT	1st Nov., 1890, to 31st Oct., 1891	1891 to 1892	1892 to 1893	1893 to 1894	1894 to 1895	1895 to 1896	1896 to 1897	1897 to 1898	1898 to 1899	1899 to 1900	TOTALS
Ancoats	31	195	54	70	7	97	113	53	25	28	673
Central.....	} NOTE:— 193 Artisans' Dwellings	...	...	...	...	...	...	...	...	...	193
St. George's											
Cheetham	8	38	76	97	37	155	269	370	315	128	1,493
Crumpsall	17	7	18	24	44	39	37	41	18	102	347
Blackley	29	11	13	5	19	41	31	56	67	58	330
Harpurhey	55	60	60	170	191	342	253	346	327	169	1,973
Moston	22	12	74	89	148	193	225	263	248	282	1,556
Newton	40	20	10	30	65	140	96	136	134	110	781
Bradford	36	39	49	21	65	67	198	91	103	198	867
Beswick	2	8	15	8	...	97	118	128	98	119	593
Clayton	6	61	6	9	39	111	152	161	229	234	1,008
Ardwick	4	34	25	59	177	261	192	295	361	145	1,553
Openshaw	177	169	65	15	60	69	71	152	119	182	1,079
Gorton	178	110	30	2	2	20	87	236	178	57	900
Rusholme	51	37	76	89	211	277	294	354	486	462	2,337
C.-on-M.	26	97	97	88	18	36	46	57	1	32	498
Hulme .....	...	2	1	1	...	29	24	4	3	2	66
City Totals	682	1,093	669	777	1,083	1,974	2,206	2,743	2,712	2,308	16,247

RETURN SHOWING THE NUMBER OF HOUSES CLOSED, DEMOLISHED, OR ADDED TO OTHER HOUSES THROUGH THE ACTION OF THE SANITARY COMMITTEE, THEREBY BEING DISCONTINUED AS SEPARATE HABITATIONS, ON THE RESPECTIVE SANITARY DISTRICTS IN EACH YEAR FROM 1890 TO 1900—(JANUARY TO DECEMBER IN EACH YEAR).

SANITARY DISTRICTS	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	TOTALS
Ancoats	33	43	50	63	120	259	161	64	49	70	60	972
Central	36	74	197	83	164	131	43	41	21	66	18	874
St. George's	28	...	102	14	164	65	7	113	2	133	6	634
Cheetham	1	...	4	...	...	...	...	3	14	1	...	23
Crumpsall .....	...	...	...	...	...	...	...	...	...	...	...	...
Blackley .....	...	5	...	...	...	1	...	...	...	...	...	6
Harpurhey	7	...	...	...	...	...	...	...	...	...	...	7
Moston .....	...	...	...	...	...	...	...	...	...	...	...	...
Newton Heath .....	...	37	3	...	25	...	30	4	15	6	12	132
Bradford .....	...	4	1	...	...	...	...	...	13	16	...	34
Beswick .....	...	...	...	...	...	...	...	...	...	...	...	...
Clayton .....	...	...	...	...	...	...	...	...	...	...	...	...
Ardwick	16	4	14	22	...	...	...	...	10	...	...	66
Openshaw .....	...	...	...	3	...	2	...	...	1	1	...	7
West Gorton .....	...	9	18	...	...	4	2	...	1	5	...	39
Rusholme & Kirkhulme	...	4	9	3	...	...	...	...	...	...	...	16
Chorlton-on-Medlock ...	31	53	44	118	...	144	42	31	43	29	8	543
Hulme	11	27	31	104	213	2	136	2	16	10	1	553
City Totals	163	260	473	410	686	608	421	258	185	337	105	3906

I am indebted to the courtesy of the Medical Officers of Health of neighbouring districts for the following figures:—

1900. NEW HOUSES CERTIFIED IN OUTSIDE DISTRICTS.

Salford	674
Eccles.....	215
Withington Urban District Council:—	
Withington, including Whalley Range.....	169
Didsbury	66
Burnage	14
Chorlton-cum-Hardy.....	191
Stretford.....	265
Moss Side	403
Levenshulme	420
Droylsden	41
Urmston.....	18
Gorton... ..	352
	<hr/>
	2828

EFFLUVIUM NUISANCES.

The following are important actions which have been taken by the Corporation in respect of nuisances. Acting under the Nuisance Sub-Committee, Mr. R. M. Rowe has rendered valuable service in dealing with these nuisances.

A—Oldham Corporation Nightsoil Works at Bower Clough, near New Moston.

Complaints had been received for years in reference to the serious nuisance caused by the presence of these works to the district of New Moston. The complaints referred to two distinct sources of nuisance, viz., first, the pollution of the atmosphere with effluvia and shoddy dust from the presence of cotton shoddy at the works, from the admixture of this with crude nightsoil, from the storage of the mixed product outside the works, and finally from removing the nightsoil into boats on the Rochdale Canal, which adjoins the district of New Moston; and, secondly, to the running of liquid manure into the Moston Brook.

In March, 1899, a representation was received from a number of inhabitants in New Moston requesting the Corporation to take action.

A summons was taken out against the Oldham Corporation, and was heard on October 16th, 1899, when a fine of £2 was imposed. At this hearing it was stated, and no doubt correctly, that means had been taken to prevent liquid manure from running into the brook.

Nevertheless, the effluvium nuisance continued, and a summons was again taken out in the present year (1901). On this occasion it was not alleged that the brook was polluted, but that the effluvia were nowise diminished, though it was admitted that the air was no longer liable to be full of shoddy dust.

The evidence of nuisance was, however, very strong, and at the hearing of the summons at Chadderton on July 1st, 1901, a fine of £4 was inflicted, with £5 costs. It was stated on behalf of the Oldham Corporation that the pail-closets were now being rapidly converted into waste-water-closets.

B—Nuisance arising from the Holt Town Works.

A summons was taken out on April 26th, 1899, in regard of offensive effluvia from these works. The Cleansing Committee called in Messrs. Thomson and Estcourt to advise them, and a system of ventilation was put in intended to remove the effluvia from the rooms in which the contents of the driers are stored, as well as from the mixing room. The contents of the driers are also removed to the storeroom without exposure to the air. So far as can be judged, the methods adopted have proved successful in abating the nuisance. The summons was withdrawn on December 16th, 1900.

*C—Nuisance arising from —————'s Manure Works,
—————, Bradford.*

A summons was issued against this firm on October 12th, 1899, a petition having been received from ten or more inhabitants of the district complaining of a nuisance. At these works artificial manure is manufactured, and as a first step slaughter-house refuse, including bones, were boiled in four pans, the lids of which were placed in communication with the chimney of the boiler used to raise the steam required for working a bone mill, etc. The chief nuisance arose from the effluvia given off from these boilers, and from emptying them at the conclusion of boiling.

The boiled materials, in so far as used for making manure, are fixed with sulphuric acid, and mixed with soot and flue dust, kainite, and superphosphate. The product is a material smelling like guano.

Additional sources of nuisance to that first mentioned were—

- (1) Part of the premises was used as a knackery.
- (2) A number of pigs were kept (41 in all) which caused a nuisance.
- (3) A large heap of manufactured material was stored in the knackery.

At the first hearing of the summons on November 16th, the defendants undertook to remove the pigs, and announced their intention of replacing the pans by closed digesters. This they carried out, but without removing the nuisance; and at the adjourned hearing on February 9th, 1900, the case

was again adjourned. The defendants then called in Mr. Sutcliffe, who advised them as to extracting the air from the chamber enclosing the digesters by a fan, by which it is driven through the furnace of the steam boiler. The nuisance has apparently been removed by these means.

The final hearing of the case was on May 1st, 1900, when, in consideration of the efforts made to abate the nuisance, Mr. Headlam, the Stipendary Magistrate, inflicted the minimum penalty of 40s. with £5 costs.

D—*Chemical Nuisance, Miles Platting.*

In the Annual Report for 1899, it was mentioned that a prosecution had taken place of two firms in Miles Platting for alleged nuisances caused in the neighbourhood of Varley Street. One of these firms was convicted.

Amongst the nuisances which were alleged was the occurrence of noxious smells in the course of the Ridgway Street and Sandal Street sewers. These sewers were under observation for a considerable time, and samples of the sewage were examined by Mr. Fowler and Mr. Rowe, but no noxious ingredients were found. The manholes in the Ridgway Street sewer were, it is true, found to be thickly coated with naphthalene. The Ridgway Street sewer received the waste liquid from Messrs. —————'s benzol rectifying plant and from the —————'s works, both in Canal Street.

On October 3rd, 1898, an explosion occurred in Sandal Street, several manholes being lifted. I received information of this occurrence about three months after the event, and though (probably wrongly) I suspected an escape of benzol into the sewer, no confirmation of this suspicion was obtained, nor, as already mentioned, was anything dangerous discovered in the sewer.

Again on June 5th, 1900, an explosion took place in a cellar in Bradford Road, which, it was believed, could not be connected with the previous occurrence, as it was then believed that the house drain was connected with the Bradford Road sewer.

This drain was, it seems, subsequently found to be in connection with the Ridgway Street sewer.

On May 3rd, 1901, an explosion took place in the Whitby Street, Sandal Street, Ridgway Street, Woodward Street, and Holland Street sewers. It was, however, most violent in the Sandal Street sewer. Fortunately, no harm to life or limb resulted.

The scene of the last explosion was at once visited by several officers of the Corporation, and an investigation was at once commenced. Mr. Fowler, Chemist of the Rivers Department, discovered the presence of bi-sulphide of

carbon in the sewage. It was also voluntarily admitted by the Company that a discharge of this material had taken place into the sewer, and a Sub-Committee was at once appointed to investigate the occurrence, and to take effectual steps to prevent its recurrence.

It is believed that this has been effected, while, on the advice of Mr. Hudson, notice has been issued to all chemical manufacturers in accordance with the requirement of the Public Health Acts Amendment Act, 1890, section 17, sub-section 3, so that a prosecution may be instituted should it in future be proved that any chemical manufacturer is turning into the sewers injurious materials as defined by the Act.

E—Prosecution of Chemical Manufacturers—Blackley.

Numerous complaints having been received from the inhabitants of Blackley and Cheetham, and from the Crumpsall Workhouse, of nuisances arising from these works during 1899 and 1900, and a representation having been received by the Sanitary Committee from ten or more inhabitants of the districts affected, a prosecution was directed on July 6th, 1899. Dr. Bailey, of the Owens College, was engaged as expert for the prosecution, and careful observations were made both by him and by Mr. R. M. Rowe, of the Sanitary Department. The nuisances chiefly complained of were—

- (1) Acid fumes from the acid rectifying plant.
- (2) Excessively unpleasant smells of a chemical nature, and particularly of naphthylamine.

Mr. Headlam decided on October 22, 1900, that the nuisances had been proved, and fined the firm £5, with £50 costs.

F—Gore Brook.

Numerous complaints were received in regard to nuisances arising from the Gore Brook, which lower down becomes the Birch Brook. The Sanitary Committee undertook to deal with this nuisance, and Mr. Fowler and Mr. Rowe arranged for the continuous admission into the brook during the warm and dry weather of chlorinated soda, a procedure which was effectual in removing the nuisance.

WORK OF THE LADIES' PUBLIC HEALTH SOCIETY AND THE LADIES' SOCIETY FOR VISITING THE JEWISH POOR.

The following table shows the amount of work these Societies have done during the year 1900:—

(a) LADIES' HEALTH SOCIETY.

DISTRICT	Number of Cottages in District	HOUSES VISITED		CONDITION OF HOUSES						No. of Houses containing Lodgers	Complaints requiring action by Sanitary Department	SICKNESS			Leaflets left at Houses	Disinfecting Powder left at Houses	LIMEWASHING							Reports as to Children (clothing, food, &c.)	Help Rendered Help rendered includes :—Giving food, clothing, &c., advising mothers as to care and treatment of children, making of sick beds, cleaning houses for sick persons, obtaining recommends for Convalescents, &c.	Death Cards	Average Death-rate		
		First Visit	Not First	Dilapidated	Not Dilapidated	Clean	Dirty	Improved since last Visit	Not Improved			Overcrowded																	
1. Ancoats, West.....	1434	8	1797	14	1791	1732	73	126	847	2	255	68	49	664	713	1784	1783	100	24	33	32	5	...	52	4	...	120	122	42'0
2. Ancoats, North	2137	1160	437	64	1533	1408	189	194	241	1	58	00	23	247	270	1740	1530	74	61	88	83	4	6	144	12	19	138	128	30'7
3. Ancoats, Central.....	1021	83	1703	52	1734	1599	187	552	595	2	45	47	83	454	537	1689	1723	215	113	141	145	18	13	223	35	9	380	90	39'2
4. Ancoats, South	1398	85	1831	20	1896	1247	669	473	967	7	295	68	39	397	430	2217	1897	202	318	330	331	38	120	155	15	84	362	135	32'7
5. Ancoats, East	1166	97	2089	7	2179	2137	49	427	870	1	9	25	4	188	192	2178	2176	58	77	24	1	1	...	...	...	9	51	94	29'2
6. London Road	1820	26	2167	180	2013	2028	165	1214	933	4	517	101	44	455	499	2789	2187	276	85	229	231	55	24	393	16	26	234	169	34'0
7. Deansgate.....	1705	2	1980	25	1957	1510	472	392	1588	6	291	110	22	338	360	2064	1703	202	86	168	108	14	24	30	60	5	135	150	35'3
8. St. George's, North	3052	80	1641	8	1713	1688	33	244	1336	6	136	62	33	184	217	1465	1537	28	24	15	16	...	1	15	1	7	66	155	26'8
9. St. George's, East	1421	...	2354	32	2322	2335	19	424	1930	...	110	74	43	238	281	2348	2305	37	218	23	25	6	...	21	2	...	139	213	25'1
10. St. George's, Central.....	1422	...	1646	72	1574	1503	143	183	713	11	366	133	27	359	386	1521	1364	276	66	17	15	24	...	23	9	19	183	109	39'2
11. Angel Meadow.....	1023	446	1951	64	2333	2294	103	226	1222	3	411	120	21	175	196	2361	2268	2	4	5	...	...	...	4	...	2	219	67	50'9
12. Chorlton-upon-Medlock, North.	1808	47	1998	2	2043	1905	140	379	832	...	327	49	26	281	307	2437	1961	65	60	83	79	22	2	106	9	3	243	169	32'9
13. Chorlton-upon-Medlock, South.	893	3	1962	11	1954	1678	287	335	1598	6	346	56	15	170	185	2026	1937	107	116	137	123	37	...	192	18	34	283	185	25'4
14. Hulme, West	830	10	1197	431	776	1075	132	317	878	12	487	67	31	352	383	1034	980	240	107	107	107	45	24	197	44	31	212	59	34'7
15. Hulme, Central	3288	2014	...	162	1852	1721	293	...	...	...	171	98	50	242	292	2014	1981	86	98	116	47	36	3	88	8	1	180	211	28'8
16. Hulme, East.....	1134	35	1982	8	2009	1491	526	116	893	3	672	49	41	507	548	1817	1734	110	42	122	123	14	5	139	10	50	350	105	34'8
TOTAL	25552	4996	26735	1152	29679	27351	3480	5602	15443	64	4496	1187	551	5251	5802	31484	29078	2078	1499	1638	1526	319	222	1782	243	299	3295	2161	33'9

(b) LADIES' SOCIETY FOR VISITING THE JEWISH POOR.

17. Red Bank	657	2	797	35	764	749	50	80	320	1	102	136	13	130	143	737	4	1	9	2	3	...	4	1	...	88	17'3
18. Strangeways	394	25	1121	25	1121	1059	87	135	529	...	646	241	10	107	117	1158	...	48	90	89	11	...	7	...	...	23	18'5
TOTAL	1051	27	1918	60	1885	1808	137	215	849	1	748	377	23	237	260	1895	4	49	99	91	14	...	11	1	...	111	...
GRAND TOTAL	26603	4123	28653	1212	31564	29159	3617	5817	16292	65	5244	1564	574	5488	6062	33379	2082	1548	1737	1617	333	222	1793	244	299	2161	17'9

The work performed by these Societies for a number of years in teaching personal and household cleanliness in the poorer districts of the City has had a marked effect in these districts, and an improvement on former conditions can now generally be discerned. At the same time there is still much to be done to counteract the bad habits of many of those who occupy the slums of our City. The Medical Officer of Health desires here to acknowledge the valuable services rendered by the Lady Officers and District Lady Superintendents of the Societies in guiding and aiding the work of the Female Health Visitors, and for the sympathy which they manifest in their work amongst the poor. A perusal of the table shows a large record of work.

The Health Visitors have made 26,603 inspections of houses in the course of systematic house-to-house visitation in their respective districts. They have also made 2,161 special enquiries in cases of death, and noted 1,564 complaints as to insanitary conditions which they have detected in the course of their daily work.

They have distributed no fewer than 33,379 leaflets on the following matters :—

1. The prevention of diarrhœa.
2. The prevention of consumption.
3. Precautions against measles.
4. Precautions against whooping cough.
5. Suggestions to householders.
6. How infants should be fed, etc.

By the distribution of the leaflets and by personal instruction a system of educational work is constantly going on amongst the poor.

Disinfecting powder has been left at 30,958 houses.

Several tons of soap have been sold to the poorer inhabitants, and the importance of cleanliness of their houses and persons is steadily inculcated.

Limewashing.—The visitors supply brushes, on loan, and give the necessary sanitary dry lime to tenants of houses who will undertake cleansing. During the year they have been enabled to get 9,332 rooms, yards, closets, etc., thoroughly cleansed and limewashed. To this portion of their work the Medical Officer of Health attaches great importance.

In the course of their daily visits they came across 299 cases of neglected children. The parents were warned in many instances, and others were reported to the Society for the Prevention of Cruelty to Children.

Help was rendered to 3,406 families in many ways, such as in food and clothing, advising mothers as to the management of their children, making the beds of sick patients and cleaning their houses, obtaining recommends for Convalescent Homes, and in the summer months arranging to send children

into the country for a holiday, and to the Manchester Camps for Poor Children at the Seaside.

During the year they have been engaged in another very important work, viz., supervising the disinfection of houses in cases of consumption, and seeing to their subsequent cleansing, and with one or two exceptions this work is carried out to my entire satisfaction. At the end of the year they had 285 cases of consumption under observation in their respective districts. It is their duty to report monthly as to whether the house is clean and free from dust and dirt, and every three months they see that a thorough cleansing of the house takes place, so as to keep down infective material as much as possible, viz., the walls are rubbed down with dough, the floors and furniture washed, and the bed clothing and personal clothing of the patient washed in boiling water.

Special Work in the Jewish Quarter of the City.

About the middle of 1899 the Sanitary Committee decided to appoint a Visitor for special work in the Jewish quarter, about the neighbourhood of Red Bank. The Visitor commenced her duties in August of that year, and has since been steadily at work. The streets which she has visited to the end of the year are—Ferne Street, Cliff Street, Winter Street, Davison Street, Verdon Street, Back Verdon Street, Scotland, Scotland Court, Park Street, Clarissa Place, Lord Street (Red Bank), Lord Street (Cheetham), Red Bank, Whitfield Street, Robert Street, and Pimblett Street.

A thorough house-to-house inspection has been made, and by far the majority were found in a very dirty condition, dilapidated, and in a bad state of repair generally, with the exception of the houses in Lord Street (Cheetham), Whitfield Street, Robert Street, and Pimblett Street.

However, with systematic visitation, and showing the tenants of the houses that the Sanitary Authority is determined to make an impression on the area, a decided improvement has taken place. The houses are now kept much cleaner, the walls of living-rooms and bedrooms have been repapered; ceilings, yards, cellars, privies, etc., limewashed; defects in roofs, walls, etc., remedied; and the drains, in many instances, reconstructed. With repeated visits being made, the personal and household improvement is maintained, and a great improvement is visible over the area.

The Unhealthy Dwellings Sub-Committee have also been at work, and the houses in Scotland, Back Scotland, and Park Street are now completed and again occupied, these being converted into through houses, with yards and water-closets provided. There are also five houses in Cliff Street and one in Winter Street which have been similarly dealt with, and are now again occupied. In addition, the Committee have condemned the houses in Verdon Street, and have inspected the houses in Back Verdon Street and Scotland Court, with a view to reconstruction.

MONSALL HOSPITAL.

REPORT FOR THE YEAR 1900. BY DR. R. W. MARSDEN.

During the past 12 months the work in the hospital has been exceptionally heavy, and the energies of the staff have been taxed to their uttermost. It is, however, gratifying to record that all have willingly responded to the extra strain, though assistance had to be sought by engaging nurses from other institutions. The year has been notable for the number of cases admitted into the hospital. A total of no less than 2,957 was reached for the 12 months, compared with 1,771 in 1899. This total is the highest yet recorded, and an idea of the work entailed may be gathered from the fact that the average daily number of patients has been 440·61, whereas during 1899 the daily average was 248·45.

Though the total admissions forms the maximum attained hitherto, yet the net mortality for all cases is the lowest that has been reached, the previous minimum of 7·11 per cent. for 1899 being still further reduced during 1900 to 6·22 per cent. Unfortunately it is not admissible to claim such a reduction as due to an improvement in treatment. It must be noted that the most important factor is the relative percentage of the various diseases. One finds, therefore, that the low mortality is due to the large proportion and unusual number of cases of Scarlet Fever, the diminution in the number of cases of Enteric Fever, with its higher death-rate, being almost exactly counterbalanced by the increase in Diphtheria with its still greater mortality. Despite this increase in the work of the hospital, I am pleased to be able to record that the general health of the staff has been good. It is always to be expected that a certain percentage will contract one or other of the various infectious diseases, and during the past 12 months one of the medical staff, nine nurses, and two servants suffered from Scarlet Fever. I am sorry to add that one of the nurses died. The number of nurses who contracted Diphtheria has, however, been less than during 1899, having fallen from 15 to 5, and all recovered. The most gratifying improvement has been in connection with Enteric Fever. I have not previously reported to the Committee that at the end of 1899 I offered to the nursing staff facilities for inoculation with typhoid vaccine before they entered upon their duties in the "typhoid ward." Undoubtedly, from its high mortality and its protracted course, Enteric Fever is the source of greater anxiety to the responsible resident than any other of the commoner infectious diseases. Up to the time mentioned, during my own period of residence, there had not been a year in which some of the nurses had failed to contract the disease. The

inoculations have now been given for 18 months, and during this period only one nurse has suffered from Enteric Fever. I should state that the nurses are not compelled to be inoculated; they are only advised or recommended to accept it as a prophylactic remedy. The nurse who contracted Enteric Fever was not one of the inoculated, and the result has been that since the occurrence not a single one has refused the recommendation, unless she has previously suffered from an undoubted attack of Enteric Fever. It is evident that a longer time must elapse before satisfactory statistics will be furnished by the hospital as to the value of the vaccine as a means of prophylaxis.

There have been, as usual, numerous cases of sore throat amongst the various members of the staff, of different degrees of severity, but not attributable to Scarlet Fever or Diphtheria. Fortunately all recovered.

STATISTICAL REPORT FOR THE YEAR 1900.

Remaining in Hospital January 1st, 1900	447
Patients Admitted during 1900	2957
	<hr/>
	3404
	<hr/>

Discharged.

Cured and Died.....	2881
Remaining in Hospital December 31st, 1900.....	523
	<hr/>
	3404
	<hr/>

Total Number of Deaths during 1900.....	184
Net Mortality	6.22%.

Of the deaths, 34 occurred within 48 hours of admission.

Daily Averages.

Patients	440.61
Nurses and Servants	137.35
Officers.....	6.56
Daily average stay, in days.....	55.57

TABLE SHOWING MONTHLY DISTRIBUTION OF PRINCIPAL DISEASES
ADMITTED THROUGHOUT THE YEAR.

1900	Scarlatina	Diphtheria	Enteric Fever	Morbilli	Pneumonia	Erysipelas	Unclassified	Total	Daily Average Number of Patients in Hospital
January ...	175	12	26	2	1	1	24	241	424.3
February..	170	10	10	4	2	1	6	203	448.0
March ...	180	16	11	0	2	3	13	225	451.5
April	168	7	28	1	2	0	13	219	453.0
May	191	9	24	3	0	1	11	239	457.0
June	156	17	10	1	2	1	9	196	413.9
July	168	38	4	1	0	3	9	223	385.6
August ...	186	16	19	4	0	2	9	236	375.4
September	220	13	28	3	0	3	15	282	427.9
October ...	260	25	26	0	0	1	30	342	507.7
November	208	16	21	0	0	1	14	260	487.9
December.	213	8	21	2	4	2	41	291	508.3
Total	2295	187	228	21	13	19	194	2957	444.8

TABLE SHOWING NUMBER OF VARIOUS DISEASES.

DISEASE	Remaining in Hospital, Jan. 1st, 1900	Admitted to Dec. 31st, 1900	Dismissed, Cured, and Died During 1900	Remaining in Hospital, Dec. 31st, 1900
Scarlatina	363	2294	2212	445
Diphtheria	46	187	216	17
Enteric Fever.....	31	228	229	30
Pneumonia	1	13	13	1
Erysipelas	1	19	19	1
Morbilli	4	21	23	2
Unclassified .....	...	196	163	33
Total...	446	2958	2875	529

SCARLATINA.

AGE OF PATIENTS	MALE			FEMALE			TOTAL		
	Ad-mitted	Died	Mor-tality per cent.	Ad-mitted	Died	Mor-tality per cent	Ad-mitted	Died	Mor-tality per cent.
Under one year...	4	1	25·0	8	...	...	12	1	8·3
1 to 2 years...	40	8	20·0	23	5	21·7	63	13	20·6
2 to 3 „ ...	60	6	10·0	52	6	11·5	112	12	10·7
3 to 4 „ ...	82	10	12·1	99	9	9·1	181	19	10·4
4 to 5 „ ...	118	14	11·8	108	8	7·4	226	22	9·7
5 to 10 „ ...	449	16	3·5	518	9	1·7	967	25	2·5
10 to 15 „ ...	211	3	1·4	256	1	0·4	467	4	0·9
15 to 20 „ ...	78	2	2·5	78	...	...	156	2	1·2
20 to 25 „ ...	23	...	...	33	1	3·0	56	1	1·7
25 to 30 „ ...	15	...	...	16	1	6·2	31	1	3·2
Over 30 „ ...	7	...	...	17	1	5·8	24	1	4·1
Total	1087	60	5·5	1208	41	3·3	2295	101	4·6

Fourteen deaths occurred within 48 hours of admission.

PERCENTAGE COMPLICATIONS DURING SCARLATINA.

AGE OF PATIENTS		Albuminuria	Hæmorrhagic Nephritis	Nephritis	Otitis	Adenitis	Synovitis	Scarlatina Anginosa	Rhinitis
Under one year	.....	...	...	...	8·3	16·6	...	...	58·3
1 to 2 years	.....	6·3	...	3·1	25·3	25·3	...	4·7	63·4
2 to 3 „	.....	6·2	0·9	4·4	30·3	25·0	...	2·6	62·5
3 to 4 „	.....	2·2	3·3	4·4	28·3	23·8	0·6	0·5	61·1
4 to 5 „	.....	3·9	2·6	5·3	22·1	18·1	0·5	4·4	56·6
5 to 10 „	.....	4·3	2·4	3·3	16·2	19·2	2·2	0·8	40·9
10 to 15 „	.....	2·8	2·1	3·2	10·1	16·2	1·9	0·2	19·7
15 to 20 „	.....	1·2	3·2	3·2	3·2	9·6	3·8	...	13·4
20 to 25 „	.....	7·1	5·3	3·5	3·5	14·2	5·3	3·5	8·9
25 to 30 „	.....	...	...	...	...	3·2	...	...	9·6
Over 30 „	.....	4·1	...	...	...	4·1	4·1	...	8·2

In my last report I drew attention to the increase in the admissions for Scarlatina which took place in the last quarter of 1899, and an examination of the table giving the monthly distribution of the principal diseases shows that this increase was fairly evenly maintained throughout the year 1900, with the result that the total number of cases of this disease admitted was nearly double that for the previous year. On the other hand, the mortality for Scarlatina, which was last year 3·6 per cent., has been increased to 4·6 per

cent. I mentioned also that I could not account for the former very low rate by any change or improvement in treatment, and I must again attribute the slightly poorer result on this occasion to the somewhat graver type of disease met with, and the consequent admission of a relatively greater number of severe cases. This conclusion is supported by the fact that in the past year 14 of the deaths occurred within 48 hours of admission, whereas during 1899 there were only 2 such cases.

In speaking of Scarlatina, it is my duty to inform the Committee that the year 1900 was marked by more than the usual amount of Diphtheria occurring in the patients convalescing from that disease. The supervention of this complication is well recognised under these circumstances in most of the large isolation hospitals, but I regret to state that our experience of it has recently been quite exceptional. Fortunately all of the cases recovered, owing to close observation and the immediate use of antitoxin. The danger, however, is not confined to its origin whilst in the hospital, but is present in a greater degree in the liability to the first onset of the symptoms after the discharge of the patient. Such an occurrence is, of course, rare, but its very existence seems to me to call for the greatest consideration in preventing it. An epidemic of Diphtheria in various Scarlatina wards, arising towards the end of 1899, was continued in greatly diminished degree during the early part of 1900. Accordingly during the summer, in order to effectually get rid of the danger, almost all the wards were included in the specification for painting, and the autumn was entered upon with freshly-disinfected wards. It was gratifying to note that for the remainder of the year only a few isolated cases occurred, but unfortunately in the early part of the present year it again became widespread, the cases springing up in different wards within a very short time, and, so far as could be traced, the epidemic in each ward was unconnected with that in any other. Almost at the same time, however, it was remarked that the number of cases of Diphtheria admitted from the town had much increased, and one could not withstand the inference that its increased prevalence outside was responsible for its introduction into, and dissemination in, the hospital. I think it is extremely probable that a number of the cases of Scarlatina admitted about this time were also infected with Diphtheria, possibly in many instances unaccompanied by clinical manifestations, and that the want of detection of this double infection allowed of the spread of Diphtheria amongst the children living and playing in the same ward.

ENTERIC FEVER.

AGE OF PATIENTS	MALE			FEMALE			TOTAL		
	Ad-mitted	Died	Mor-tality percent.	Ad-mitted	Died	Mor-tality percent.	Ad-mitted	Died	Mor-tality percent
Under one year...	...	...	...	...	...	...	...	...	...
1 to 2 years...	...	...	...	1	1	100'0	1	1	100'0
2 to 3 „ ...	...	...	...	2	...	...	2	...	...
3 to 4 „ ...	...	...	...	1	...	...	1	...	...
4 to 5 „ ...	...	...	...	4	1	25'0	4	1	25'0
5 to 10 „ ...	14	1	7'1	13	...	...	27	1	3'7
10 to 15 „ ..	18	1	5'5	19	1	5'2	37	2	5'4
15 to 20 „ ...	23	3	13'1	17	...	...	40	3	7'5
20 to 25 „ ...	25	4	16'0	10	1	10'0	35	5	14'2
25 to 30 „ ...	15	3	20'0	14	...	...	29	3	10'3
30 to 35 „ ...	17	5	29'4	9	...	...	26	5	19'2
35 to 40 „ ...	5	1	20'0	3	...	...	8	1	12'5
40 to 45 „ ...	7	2	28'5	1	1	100'0	8	3	37'5
45 to 50 „ ...	1	...	...	4	...	...	5	...	...
Over 50 „ ...	3	2	66'6	2	...	...	5	2	40'0
Total...	128	22	17'1	100	5	5'0	228	27	11'8

Five deaths occurred within 48 hours of admission.

PERCENTAGE COMPLICATIONS DURING ENTERIC FEVER.

AGE OF PATIENTS		Diarrhoea	Constipation	Pneumonia	Bronchitis	Perforation	Relapse	Intestinal Hæmorrhage	Cystitis	Delirium	Neuritis
Under 1 year	.....	...	...	...	...	...	...	...	...	...	...
1 to 2 years	.....	...	...	...	...	...	...	...	...	...	...
2 to 3 „	.....	...	...	...	50'0	...	...	...	...	...	...
3 to 4 „	.....	...	...	...	...	...	...	...	...	...	...
4 to 5 „	.....	...	...	...	50'0	...	...	...	...	...	...
5 to 10 „	.....	...	3'7	...	14'8	...	7'4	...	...	...	3'7
10 to 15 „	.....	...	10'8	2'7	16'2	...	2'7	2'7	...	...	...
15 to 20 „	.....	2'5	7'5	2'5	15'0	2'5	5'0	2'5	...	...	2'5
20 to 25 „	.....	5'7	11'4	...	25'7	5'7	2'8	5'7	...	2'8	2'8
25 to 30 „	.....	6'8	6'8	3'4	17'7	6'8	10'3	...	3'4	...	...
30 to 35 „	.....	11'5	3'8	...	15'3	7'6	23'1	...	...	...	...
35 to 40 „	.....	...	12'6	...	25'0	...	12'6	...	...	...	...
Over 40 „	.....	5'5	5'5	5'5	22'2	5'5	5'5	...	5'5	5'5	11'1

The past year was again remarkable for the comparative paucity of cases of Enteric Fever and the complete absence of any decided autumnal epidemic, so that the total number of 267 for the year 1899 was still further reduced to 228. Here, again, the mortality has been diminished from 12·3 per cent. in the previous year to 11·8 per cent. in 1900. I mentioned in my last report that the number 12·3 was the lowest yet recorded for this disease, and I further stated that I was inclined to attribute it to the greater mildness in the type of the cases admitted. The same explanation possibly holds good for 1900, though I am bound to state that I think it is also in part due to the introduction of the practice of treating this disease by means of regular immersion in tepid water during the acute febrile period. The Committee were kind enough to make no demur to the introduction of the system, and this has been done at very little cost. The numbers are as yet too few in order to obtain any reliable statistics, and, further, for this purpose it is very desirable that the mortality over several years should be compared; still, in the absence of such definite support, my own personal judgment has thoroughly satisfied me as to the value of this method of treatment, and, from a comparison with other methods previously used, I am convinced not only of the advisability but of the necessity of making every provision for the continuance of this hydrotherapeutic measure.

MORBILLI.

AGE OF PATIENTS	MALE			FEMALE			TOTAL		
	Ad- mitted	Died	Mor- tality percent.	Ad- mitted	Died	Mor- tality percent.	Ad- mitted	Died	Mor- tality percent.
Under 1 year.....	2	1	50·0	1	...	...	3	1	33·3
1 to 2 years ...	...	...	...	...	...	...	...	...	...
2 to 3 „ ...	3	...	...	3	1	33·3	6	1	16·6
3 to 4 „ ...	2	...	...	2	...	...	4	...	...
4 to 5 „ ...	...	...	...	...	...	...	...	...	...
5 to 10 „ ...	1	...	...	2	...	...	3	...	...
10 to 15 „ ...	...	...	...	...	...	...	...	...	...
15 to 20 „ ...	1	...	...	...	...	...	1	...	...
20 to 25 „ ...	1	...	...	2	...	...	3	...	...
25 to 30 „ ...	...	...	...	1	...	...	1	...	...
Total...	10	1	10·0	11	1	9·1	21	2	9·5

One death occurred within 48 hours of admission.

ERYSIPELAS.

AGE OF PATIENTS	MALE			FEMALE			TOTAL		
	Ad- mitted	Died	Mor- tality per cent.	Ad- mitted	Died	Mor- tality per cent.	Ad- mitted	Died	Mor- tality per cent.
Under 5 years ...	1	...	...	...	...	...	1	...	...
5 to 10 „ ...	1	...	...	1	...	...	2	...	...
10 to 15 „ ...	1	...	...	...	...	...	1	...	...
15 to 20 „ ...	1	...	...	...	...	...	1	...	...
20 to 25 „ ...	2	...	...	...	...	...	2	...	...
25 to 30 „ ...	1	...	...	...	...	...	1	...	...
30 to 35 „ ...	...	...	...	2	1	50'0	2	1	50'0
35 to 40 „ ...	...	...	...	3	...	...	3	...	...
40 to 45 „ ...	1	...	...	1	...	...	2	...	...
45 to 50 „ ...	1	...	...	1	...	...	2	...	...
Over 50 „ ...	1	...	...	1	...	...	2	...	...
Total...	10	...	...	9	1	11'1	19	1	5'2

PNEUMONIA.

AGE OF PATIENTS	MALE			FEMALE			TOTAL		
	Ad- mitted.	Died.	Mor- tality percent.	Ad- mitted.	Died.	Mor- tality per cent.	Ad- mitted.	Died.	Mor- tality percent.
Under 5 years ...	2	...	...	4	...	...	6	...	...
5 to 10 „ ...	2	...	...	1	1	100'0	3	1	33'3
10 to 15 „ ...	...	...	...	1	...	...	1	...	...
15 to 20 „ ...	...	...	...	1	...	...	1	...	...
20 to 25 „ ...	1	...	...	...	...	...	1	...	...
25 to 30 „ ...	...	...	...	...	...	...	...	...	...
30 to 35 „ ...	...	...	...	...	...	...	...	...	...
35 to 40 „ ...	...	...	...	...	...	...	...	...	...
40 to 45 „ ...	1	...	...	...	...	...	1	...	...
45 to 50 „ ...	...	...	...	...	...	...	...	...	...
Over 50 „ ...	...	...	...	...	...	...	...	...	...
Total ...	6	...	...	7	1	14'2	13	1	7'6

TYPHUS FEVER.

AGE OF PATIENTS	MALE			FEMALE			TOTAL		
	Ad- mitted	Died	Mor- tality percent.	Ad- mitted	Died	Mor- tality percent.	Ad- mitted	Died	Mor- tality percent.
Under 5 years ...	...	...	...	1	...	...	1	...	...
5 to 10 „ ...	...	...	...	...	...	...	...	...	...
10 to 15 „ ...	...	...	...	1	...	...	1	...	...
15 to 20 „ ...	...	...	...	...	...	...	...	...	...
20 to 25 „ ...	1	...	...	2	...	...	3	...	...
Over 25 „ ...	...	...	...	1	...	...	1	...	...
Total...	1	...	...	5	...	...	6	...	...

A few cases of Typhus Fever in which a connection with the epidemic in the early part of 1901 has been traced by the Medical Officer of Health were received during 1900. In all, 6 cases of this disease are known to have been admitted, all of which recovered. It is interesting to note that all were of a comparatively mild nature, and this fact, coupled with the absence of any knowledge that an epidemic of Typhus Fever existed, or that the different cases had any connection, as well as a lack of personal acquaintance with the disease owing to its rarity, accounts for their reception and detention as instances of either Enteric Fever or Scarlatina. They were accordingly treated in wards along with patients suffering from one or the other of these two diseases, yet there was no evidence of any spread of infection. No one can read the records of epidemics of Typhus Fever in previous years without being struck by the conclusive evidence of its highly infectious character. It is, of course, admitted that the risk is very greatly diminished when dealing with isolated cases. Still, the circumstances under which these cases were treated, when neither nurses nor adjoining patients contracted the disease, seem to justify the inference that under suitable hygienic conditions this infectiousness loses its former terrors, and it is also gratifying to know that the wards of this hospital so well fulfil the necessary conditions.

UNCLASSIFIED.

DISEASE	MALE	FEMALE	DISEASE	MALE	FEMALE
Tonsillitis	12	20	Brought forward...	30	48
Tuberc. Peritonitis ...	1	...	Catarrh	2	1
„ Meningitis ...	...	1	Phthisis	2	...
Cellulitis	2	...	Appendicitis	1	2
Acute Nephritis	1	...	Dentition .....	...	1
Gastro Enteritis	1	...	Dental Abscess	1	...
Hysteria .....	...	1	Cardiac Disease .....	...	1
Rötheln	7	5	Myxoma .....	...	1
Varicella	1	1	Impetigo .....	...	1
Scabies.....	1	...	Gangrenous Stomatitis	...	2
Puerperal Fever ... ..	...	15	Diarrhoea	1	...
Inanition .....	...	1	Ichthyosis	1	...
Anæmia .....	...	1	Pyæmia	2	...
Pleuritis	1	...	Eczema .....	...	2
Asthma	1	...	Arsenical Poisoning ..	1	...
Ozoena	1	...	Comp. Fracture of Leg	...	1
Coryza .....	...	2	Chronic Ulcer of Leg.	1	...
Pertussis	1	1	Dermatitis	1	...
Carried forward.....	30	48	Total.....	43	60

Patients with no stated illness 85

Patients unclassified 103

Total..... 188

Patients cured 171

Patients died (6 male and 11 female)..... 17

Total..... 188

Net Mortality on Unclassified Cases 9.04

CASE MORTALITY FOR 1892-1900.

Year 1892	12·32	Year 1897	8·60
„ 1893	9·36	„ 1898	10·70
„ 1894	7·82	„ 1899	7·11
„ 1895	9·73	„ 1900	6·22
„ 1896	10·60		

Total average Case Mortality for the last nine years—9·16.

YEAR	DISEASE	MORTALITY PER CENT.	YEAR	DISEASE	MORTALITY PER CENT.
1890	Scarlatina	12·2	1890	Enteric fever	16·4
1891	Do.	6·9	1891	Do.	19·1
1892	Do.	9·1	1892	Do.	19·1
1893	Do.	6·9	1893	Do.	18·6
1894	Do.	4·4	1894	Do.	15·9
1895	Do.	7·1	1895	Do.	20·1
1896	Do.	8·5	1896	Do.	19·6
1897	Do.	6·1	1897	Do.	13·3
1898	Do.	6·7	1898	Do.	16·1
1899	Do.	3·6	1899	Do.	12·3
1900	Do.	4·6	1900	Do.	11·8

DIPHThERIA.

AGE OF PATIENTS	MALE			FEMALE			TOTAL		
	Ad-mitted	Died	Mor-tality percent.	Ad-mitted	Died	Mor-tality percent.	Ad-mitted	Died	Mor-tality percent.
Under 1 year ...	...	...	...	1	...	...	1	...	...
1 to 2 years ...	12	4	33·3	7	4	55·5	19	8	42·1
2 „ 3 „ ..	9	...	...	11	4	36·3	20	4	20·0
3 „ 4 „ ...	11	1	9·1	12	3	25·0	23	4	17·3
4 „ 5 „ ...	9	3	33·3	13	2	15·3	22	5	22·7
5 „ 10 „ ...	37	8	21·6	26	4	11·1	63	12	19·1
10 „ 15 „ ...	11	...	...	4	...	...	15	...	...
15 „ 20 „ ...	3	...	...	1	...	...	4	...	...
20 „ 25 „ ...	2	1	50·0	8	...	...	10	1	10·0
25 „ 30 „ ...	...	...	...	5	1	20·0	5	1	20·0
Over 30 years ...	1	...	...	4	...	...	5	...	...
Total	95	17	17·8	92	18	19·5	187	35	18·7

9 Died within 24 hours of admission.
3 „ 48 „

It is to be regretted that Diphtheria has again shown a marked increase as compared with the year 1899, though the number of cases in that year was considerably above any previous record since the adoption of the bacteriological test. An examination of the table shows that during the two months July and October, no less than 38 and 25 cases respectively were admitted. As the accommodation for this disease is limited to 20 beds, it is evident that this has been sorely taxed, though fortunately on each occasion one of the smaller wooden pavilions was at liberty, and its use tided us over the difficulty.

It is gratifying to note that the mortality from Diphtheria has fallen from 22·2 per cent. in the year 1899 to 18·7 per cent. in 1900. It cannot be too frequently mentioned that the death-rate from Diphtheria depends on the promptness with which the disease is cut short by the administration of antitoxin before any grave changes can have resulted from the diphtheritic toxæmia. In this connection it is evident either that the medical practitioner must himself inject the remedy at the earliest possible moment, or that none but the mildest cases must be detained before admission. I am pleased to say that, though a death-rate of 18·7 per cent. allows of great room for improvement, yet the amelioration already obtained is apparently, in part, due to both of the above causes.

As I mentioned in my last report, the promptness with which the disease is cut short is usually reckoned by the number of hours or days which have elapsed between its onset and the injection of the antitoxin; but I further stated that this standard, unfortunately, does not take cognisance of the extremely different rates at which a certain degree of toxæmia will be reached in individual cases, according to the rapidity of extension of the local process.

Undoubtedly the time will be found to be less for the recoveries than for the deaths when dealing with any considerable number of cases. During the past year it is found that an average of just under three days had elapsed in those who recovered, whereas in the deaths this average interval was increased to almost five days. Incidentally it is interesting to note that the limit of three days has been fixed by the Medical Officer of Health as the period during which antitoxin will be supplied by the Health Department, the probable futility in its late administration being borne out by our experience in the hospital.

It is, I think, not sufficiently well recognised how valuable a careful consideration of the throat, glandular infiltration, and urine is in gauging the degree of toxæmia. With an extensive deposit of membrane about the fauces or pharynx, especially when this shows signs of disintegrating, and has lost its clean white or yellow appearance; or when the glands at the sides

of the neck are considerably enlarged, and especially if there is any periglandular inflammation; or, again, when there is a distinct deposit of albumen in the urine on boiling, and especially if the amount of urine is diminishing in quantity, one can infer either that the case is of some duration, or extremely rapid, and in any case under such circumstances that the toxæmia has proceeded so far before the administration of the antitoxin as to make the possibility of recovery very slight indeed when dealing with young patients. If one examines the cases, keeping the above points in mind, one finds that of the 152 recoveries, in no less than 122 there was evidence that the 'toxæmia' had not proceeded to any great degree; whilst in only 24 did the condition on admission at all agree with the above description; but after excluding from the deaths eight which were due to the mechanical effect of the diphtheritic deposit in the respiratory tract, causing asphyxia, one finds in the remaining 27 that no less than 25 showed evidences of marked 'toxæmia' on admission.

The same result almost is obtained by taking the points singly. Thus, considering the glands of the 152 recoveries, in 102 these were either absent or only slightly enlarged, in 38 they were distinctly enlarged and tender, and in only 10 was there periglandular inflammation; whereas, amongst the deaths, in one only (excluding special cases, *i.e.*, intra-pulmonary) were the glands slight, and this case had suppression of urine for two days before admission; in 15 they are noted as distinctly enlarged, and in other 15 as showing periglandular œdema.

It must be remembered that the glands are affected before the kidneys, so that, as showing a later and more generalised 'toxæmia,' the degree of diphtheritic nephritis existing before the antitoxin is injected is probably of the greatest value in gauging the amount of mischief done. Even taking into account the lessened vulnerability or increased power of recovery of certain organs in different individuals, as well as its less serious import possibly in adults, I think the evidence as regards the amount of albumen and the amount of urine, of the extent to which the kidney is affected, forms the safest factor on which to base a good or bad prognosis. Thus, amongst the 152 recoveries, in only 16 was the amount of albumen on admission sufficient to cause a well-marked deposit on boiling, and in 129 it was either free from albumen or did not contain more than a decided trace. In the deaths, however, though in several instances the patients died before an examination could be made, yet where this was possible one found in 18 evidences of distinct nephritis, and in five only was it of very slight extent. Of these five, two must be subtracted, since the patients died from intra-pulmonary obstruction.

TRACHEOTOMY CASES.

AGE OF PATIENTS	MALE			FEMALE			TOTAL		
	Cases	Died	Mor- tality per cent.	Cases	Died	Mor- tality per cent.	Cases	Died	Mor- tality per cent.
Under 1 year.....	...	...	...	...	...	...	...	...	...
1 to 2 years ...	4	1	25'0	1	1	100'0	5	2	40'0
2 to 3 „ ...	1	...	...	2	2	100'0	3	2	66'6
3 to 4 „ ...	4	...	...	1	...	...	5	...	...
4 to 5 „ ...	1	...	...	...	...	...	1	...	...
5 to 10 „ ...	2	1	50'0	...	...	...	2	1	50'0
10 to 15 „ ...	...	...	...	...	...	...	...	...	...
15 to 20 „ ...	...	...	...	...	...	...	...	...	...
20 to 25 „ ...	1	1	100'0	...	...	...	1	1	100'0
Over 25 years.....	...	...	...	1	...	...	1	...	...
Total...	13	3	23'1	5	3	60'0	18	6	33'3

No less than 4 of the 6 deaths after tracheotomy were due to asphyxia, caused by the presence of the diphtheritic deposit in the trachea, or larger bronchi, and therefore incapable of relief. In connection with these cases, it should be noted that so long as the growth of the diphtheritic membrane remains localised to the respiratory tract alone it is remarkable how slowly it may spread, and what slight evidences there are of the absorption of toxins. It follows, therefore, that not unfrequently the parents have only noticed the illness of the child one or two days before admission ; and yet, after excluding any laryngeal obstruction by means of a tracheotomy, one is surprised to note the extent of the intra-pulmonary mischief.

R. W. MARSDEN.

REPORT BY MR. A. T. ROOK, SUPERINTENDENT OF THE
SANITARY DEPARTMENT.

Sanitary Department,
Town Hall, Manchester.

In presenting to the Medical Officer of Health the report of the work transacted in the Sanitary Department for the year ending 30th April, 1900, I beg to state that the City, for inspection and other purposes, is divided into 28 Districts, to each of which one Sanitary Inspector has been assigned.

In addition to these, there is a Superintendent, one Chief Inspector, two Drainage, four Smoke, one Canal Boats and Lodging-house, two Adulteration of Food, six Factory and Workshops Inspectors, including two Female Inspectors, and two Drain Examiners.

In the House Drainage Department there are also six Clerks of Works for supervising and measuring up work done by the contractors employed by the department in carrying out private drainage work.

The number of complaints of nuisances of various kinds made during the year was 35,360, viz. :—

6,137	through the Medical Officer of Health's Department.
2,314	by the Public.
495	through the Police.
26,414	by the Staff.

HOUSES LET IN LODGINGS.

Under the powers given by section 90 of the Public Health Act, the bye-laws made thereunder have been enforced.

The number of houses on the register is 1,483.

To these, 1,273 day visits and 335 night visits have been paid.

Twenty-five infringements of the regulations have been reported and dealt with.

Eighty-nine visits have also been paid to unregistered houses, the occupiers having previously denied that lodgers were kept.

DAIRIES, MILKSHOPS, AND COWSHEDS REGULATIONS.

Under this Order, which was made in July, 1879, and the Regulations thereunder in 1896, 2,493 milkshops and dairies and 99 cowkeepers are now on the register. The number of cows kept is 1,335. The number of visits to dairies, milkshops, and cowsheds was 2,253. Four cowsheds have been closed as being unfit for use on sanitary grounds.

Many of the cowsheds have been much improved since last year, but there are still many in an unsatisfactory condition, and steps are being taken to improve these, but as some of them are old and very substantial structures there has been some reluctance in the past to deal with them to bring them up to the present state of sanitary improvements.

WORKSHOPS, BAKEHOUSES, SHOP HOURS, AND SEATS FOR SHOP ASSISTANTS ACTS.

During the year the Act has been well observed, only a few persons having Shop Hours Act been reported for infringements.

As regards the Shop Hours Act, experience still further confirms the opinion previously expressed that in the absence of a declaration specifying the

working hours for each day, as in the case of the Factory and Workshop Acts, it is difficult to produce sufficient evidence to justify prosecutions, the evidence of the young persons in nearly every instance, probably through the influence of their employers, or other reasons, contradicting the signed declarations previously made to the Inspectors.

Workshop Acts. Great improvements have been effected since the last report in the condition of workshops, many alterations having been made—either after notice or at the request of the Inspectors—to improve the ventilation, lighting, overcrowding, cleansing, and general sanitary conditions.

Special attention has also been given to see that premises are provided with sufficient and satisfactory closet accommodation, this being a common defect in a number of the largest workshops.

In nearly all the cases reported the necessary accommodation has been provided, and others are under notice, and will be dealt with in due course.

Means of escape in case of fire. With regard to means of escape in case of fire, the whole of the factories and workshops in the City have been inspected, and with a very few exceptions are now considered safe.

Periodical changes will, of course, from time to time take place in various ways which will bring buildings within the meaning of the Act, and necessitate the constant supervision of the Inspectors, and action on the part of the authorities.

Bakehouses. During the year several more of the worst bakehouses in the City have been absolutely closed, and a number of others have been reported by the Medical Officer of Health to be unfit for use until satisfactory alterations are made to place the premises in a better sanitary condition.

Extensive alterations have been made in many of the bakehouses, and a general improvement is manifest throughout the City consequent upon the action taken by the department.

Out-workers. Many visits have been paid to houses in which out-work is carried on, as will be seen on reference to the following tabulated statement, but constant visitation is necessary to maintain the standard of cleanliness which is to be desired, especially in houses in which shirt-making, handkerchief-hemming, brace-making, and umbrella-covering, etc., is done. This class of work is almost exclusively confined to the poorer people, who live in small houses in the congested parts of the City.

The people, as a rule, appear willing to carry out any suggestion made by the Inspectors to keep their houses clean; but at the same time it is almost impossible for small houses, sometimes containing large families, to be kept in such a satisfactory condition as workshops.

Seats for Shop Assistants Act. This Act, without the necessity of any legal proceedings, has been complied with by all the shopkeepers of the City.

The work done under the above Acts is shown in the following tables :—

SHOWING THE WORK DONE BY THE INSPECTORS UNDER THE SHOP HOURS, SEATS FOR SHOP ASSISTANTS, AND FACTORY AND WORKSHOP ACTS.

Number of District	INSPECTOR	SHOPS					SHOPS					WORKSHOPS					BAKEHOUSES						
		Shop Hours Act					Seats for Shop Assistants Act					Number of visits	Number in which Sanitary Defects were found	Number of Reports referred to Factory Inspector (unregistered factories, &c.)	Number of cases in which Magisterial proceedings have been taken	Number registered during the year	Total number on register	Number of visits	Number in which Sanitary defects were found	Number of reports referred to Factory Inspector	Number of cases in which Magisterial proceedings have been taken	Number registered during the year	Total number on register
		Number of Infringements of Act reported	Number of cases in which Magisterial proceedings have been taken	Number registered during the year	Total number on register	Number of Infringements of Act reported	Number of cases in which Magisterial proceedings have been taken	Number registered during the year	Total number on register														
1	Edw. E. Roberts.	39	1	1	592	71	2117	264	181	22	201	1020	1	4	334	17	2	5	78				
2	John Kewley ...	52	...	...	884	98	3554	269	174	10	209	1080	9	1	757	102	...	8	167		
3	Ernest Bailey ...	634	2	2	603	42	2819	133	83	1	115	954	...	2	1037	109	...	5	129				
4	Francis J. Rowe..	2	...	...	778	73	3701	172	133	1	163	1159	...	2	827	13	...	12	141		
...	Emma Coppock..	1479	...	...	...	...	2117	70	1	1	...	...	1211	...	...	...	...	...	...
...	AliceTattersall&}	1057	9	6	...	...	1302	20	1	3	...	...	1354	...	...	...	...	...	...
...	Ethel Stewart...}																						
	TOTALS ...	3263	12	9	23628571090	284	15610	928	573	38	688	42132575	9	2955	241	7	2	30	515				

PROSECUTIONS FOR OFFENCES, WITH RESULTS.

Name of Offender	Address of Offender	Offence	Amount of Fine Imposed		Amount of Costs ordered to be Paid		Dismissed, Withdrawn, &c.
Charles Rigotti	Blue Boar Court, Market Street	Employing a young person over 74 hours a week	£	s. d.	£	s. d.	.....
John Hall	51, Upper Moss Lane	Ditto	0	5 0	0	5 0	.....
James Grant	70, London Road	Ditto	0	5 0	0	7 6	.....
Pisces Limited	153, Wilmslow Road, Rusholme	Not exhibiting Abstract of Shop Hours Act in shop	0	10 0	0	10 6	Dismissed
Mary Martin	10A, Exchange Arcade	Ditto	1	1 0	0	8 6	.....
Edward Rose	541, Stockport Road	Ditto	0	5 0	0	5 0	.....
Benjamin Atkinson ..	177, Stretford Road	Ditto	0	5 0	0	5 0	.....
Samuel Bramhill ...	3, Travis Street, London Road	Ditto	0	5 0	0	5 0	.....
Patrick Roddy	116, City Road, Hulme	Ditto	0	10 0	0	8 6	.....
Morris Baker	4A, Pimblott Street, Cheetham	Having his bakehouse in a dirty state	0	10 0	0	8 6	.....
Barnet Frank	126, Red Bank	Ditto	1	0 0	0	8 6	.....
Morris Phillips	10, Park Street, Cheetham	Neglecting to abate overcrowding of workshop after an order of the justices	0	10 0	0	8 6	.....
Joseph Isaacs	26, Adeline Street, Cheetham ...	Ditto	1	0 0	0	8 6	.....
Meyer Kessler	13, Mary Street, Cheetham ...	Ditto (Notice)	.....	.....	0	7 6	Order to abate made
Jacob Reuben	7, Nightingale Street, Cheetham	Ditto (ditto)	.....	.....	.....	.....	Dismissed
Hettie Rosenstein ...	70, Lord Street, Cheetham	Ditto (ditto)	.....	.....	0	7 6	Order to abate made
Abraham Isaacs ...	33, Carnarvon Street, Cheetham	Ditto (ditto)	.....	.....	0	7 6	Ditto
		Carried forward	6	6 0	5	11 6	

PROSECUTIONS FOR OFFENCES, WITH RESULTS—continued.

Name of Offender	Address of Offender	Offence	Amount of Fine Imposed	Amount of Costs ordered to be Paid	Dismissed, withdrawn, &c.
Samuel Solkovetz ...	Skip Place, Cheetham.....	Neglecting to place workshop or closets in a sanitary condition after notice	£ 6 s. 6 d. 0	£ 5 s. 11 d. 6	Order to abate made
Reece Bevan.....	Naval Street, German Street ...	Ditto	.....	0 7 6	Ditto
Barnet Smolenski ...	3, Chase Street, Red Bank.....	Ditto	.....	0 7 6	Ditto
Joseph Samuels.....	31, Roger Street, Red Bank ...	Ditto	.....	0 7 6	Ditto
Morris Friend	Behind 1, Mousell Street	Ditto	.....	0 7 6	Ditto
Joseph Jacobs	39, Ancoats Street	Ditto	.....	0 7 6	Ditto
Morris Nathan	7, Derby Court, Long Millgate	Neglecting to comply with an order of the justices to place closets in a sanitary condition	5 0 0	0 8 6	.....
W. W. Tomlin	4, St. Ann's Square.....	Neglecting to place closet of workshop, 2, Brook Street, C.-on-M., in a sanitary condition	.....	.....	Withdrawn (work done)
Paul Klamman.....	1 B, Derby Court, Long Millgate	Neglecting to comply with an order of the justices to place closets in a sanitary condition	5 0 0	0 8 6	.....
Abraham Rosenthal.	1, Mousell Street, Cheetham ...	Ditto	0 5 0	0 5 0	....
Barnet Simpson ...	1, Ditto ditto ...	Ditto	0 5 0	0 5 0	.....
Abraham Whyman..	1, Ditto ditto ...	Ditto	0 5 0	0 5 0	.....
Reece Bevan.....	Naval Street, German Street ...	Neglecting to cleanse, limewash, or purify workshop after notice	.....	0 3 6	Withdrawn (work done)
Stanley Cosloskie ...	31, Verdon Street	Ditto	.....	0 3 0	Ditto
		Carried forward.....£	17 1 0	9 15 0	

SMOKE NUISANCES.

For the abatement of smoke nuisances, the four Inspectors appointed specially for this work have taken 1,278 timed observations of half-an-hour each, with the result that 274 notices for the abatement of nuisances have been served. Proceedings before the Magistrates have been ordered in 222 cases out of 322 offences reported. These cases were disposed of as follows :—

Two hundred and twenty-three were summoned before the justices, in 147 of which fines were imposed amounting to £358 10s., and costs £89 2s. 6d.

One was ordered to pay costs only.

Sixty-three orders of abatement were granted and served, and 14 cases were excused, dismissed, or withdrawn, and 1 case was adjourned.

In three cases fines were imposed in addition to orders of abatement being granted.

Much attention during the past year, as will be seen by the above, has been given to the nuisance caused by the emission of black smoke, not only from the furnaces connected with boilers in mills, warehouses, and other works, but also from chemical and other industries, and the efforts made have already resulted in a considerable reduction of the nuisance. It may be stated that representations have been made to other Authorities on the North-East and West sides of the City, in regard to the great pollution of the air of the City by the excessive emission of smoke from the chimneys in their districts.

SALE OF FOOD AND DRUGS ACTS AND MARGARINE ACT.

Under these Acts, the two Inspectors specially appointed have purchased for analysis 1,713 samples. Of these, 55 only were adulterated, viz. :—

Butter	...	...	...	...	...	...	...	...	17
Coffee	...	...	...	...	...	...	...	...	1
Milk	...	...	...	..	...	...	...	...	33
Mustard	...	...	...	...	...	...	...	...	1
Spirits	...	...	...	...	...	...	...	...	3

Fifty-four summonses were issued. In 38 cases fines were imposed amounting in the aggregate to £99 0s. 6d., with costs £59 19s. 10d.

Two persons were ordered to pay costs only.

Fourteen summonses were dismissed or withdrawn.

Appended are tables showing the result of the action taken under the Acts since 1873.

Table showing the number of Articles of Food and Drugs procured for Analysis, the number Adulterated, the number informally purchased or in which no proceedings were taken, and the number of cases in which Magisterial Proceedings were taken, together with the Decisions and the Total Amount of Fines imposed from May 1st, 1873, to April 30th, 1900.

Article	No. Procured	No. Adulterated	No. informally purchased or in which no proceedings were taken	No. Summoned before Magistrates.				Total Amount of Fines Imposed		
				No. Summoned	No. Fined	No. of Warrants granted	No. ordered to pay Costs only—Dismissed or Withdrawn			
								£	s.	d.
Arrowroot	6	...	...	...	...	...	...	.....
Bacon	1	...	...	...	...	...	...	.....
Baking Powder	19	...	...	...	...	...	...	.....
Beef Dripping	1	...	...	...	...	...	...	.....
Beer	340	2	2	...	...	...	...	.....
Bread	982	39	7	32	32	...	...	119	10	0
Butter	1713	312	24	288	227	3	58	396	13	6
Buttermilk	2	2	2	...	...	...	...	.....
Cheese	107	4	2	2	2	...	...	3	10	0
Chicory	42	...	...	...	...	...	...	.....
Cider	1	...	...	...	...	...	...	.....
Cocoa	1	...	...	...	...	...	...	.....
Cod Liver Oil	6	...	...	...	...	...	...	.....
Coffee	464	38	1	37	36	...	1	57	5	6
Confectionery	238	2	...	2	2	...	...	10	0	0
Cream	9	...	...	...	...	...	...	.....
Drugs	284	10	9	1	1	...	...	0	5	0
Fish (tinned)	1	...	...	...	...	...	...	.....
Flour	60	...	...	...	...	...	...	.....
Fruit (tinned)	2	...	...	...	...	...	...	.....
Jams	166	1	...	1	1	...	...	1	0	0
Jelly	2	...	...	...	...	...	...	.....
Ketchup	1	...	...	...	...	...	...	.....
Lard	616	27	5	22	18	...	4	44	3	6
Margarine	12	...	...	...	...	...	...	.....
Meats (Tinned)	6	...	...	...	...	...	...	.....
Milk	17858	1407	22	1385	949	...	436	2851	3	0
Milk (skimmed)	146	23	...	23	18	...	5	39	1	6
Milk (condensed)	6	...	...	...	...	...	...	.....
Mineral Waters, &c....	220	79	76	3	...	...	3	.....	
Carried forward	23312	1946	150	1796	1286	3	507	3522	12	0

ANALYSIS—continued

Article	No. Procured	No. Adulterated	No. informally purchased or in which no proceedings were taken	No. Summoned before Magistrates.				Total Amount of Fines Imposed		
				No. Summoned	No. Fined	No. of Warrants granted	No. ordered to pay Costs only—Dismissed or Withdrawn			
Brought forward	23312	1946	150	1796	1286	3	507	£	s.	d.
Mustard.....	271	44	6	38	32	...	6	3522	12	0
Oatmeal.....	73	...	...	...	...	...	...	18	9	0
Olive Oil	12	1	...	1	1	...	...	.....
Pepper	471	5	...	5	4	...	1	0	2	6
Pickles	4	...	...	...	...	...	...	1	7	6
Porter	4	...	...	...	...	...	...	.....
Rice, Tapioca, &c.....	91	...	...	...	...	...	...	.....
Spices	185	1	...	1	...	...	1	.....	
Spirits	816	35	7	28	25	...	3	43	17	0
Sugar.....	60	...	...	...	...	...	...	.....
Tea	330	10	7	3	2	...	1	2	0	0
Treacle	8	...	...	...	...	...	...	.....
Tripe	1	...	...	...	...	...	...	.....
Vegetables (tinned) ...	8	2	2	...	...	...	...	.....
Vinegar.....	127	8	...	8	7	...	1	2	10	6
Wines	35	...	...	...	...	...	...	.....
Totals.....	25808	2052	172	1880	1357	3	520	3590	18	6

Other Offences against the Acts.

Offence	No. Summoned	No. Fined	No. Dismissed or Withdrawn	Total amount of Fines imposed		
				£	s.	d.
Refusing to serve Inspector with Samples of Food	19	19	...	67	2	6
Giving False Warranty	13	3	10	16	0	0
Obstructing Inspector in the execution of his duty.. ..	1	...	1	.....	
Totals.....	33	22	11	£83	2	6

Total amount of Penalties for Adulteration.....	£3,590	18	6
Total amount of Penalties for Other Offences.....	83	2	6
	£3,674	1	0
Total amount of Penalties against Farmers	£1,771	12	0

Table showing the number of persons summoned more than once under the Adulteration of Food and Drugs and Margarine Acts from May 1st, 1873, to April 30th, 1900.

MILK DEALERS.

No.	Article	1st Offence	2nd Offence	3rd Offence	4th Offence	In County (Salford)
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1	Milk.	0 5 0 8 <i>W</i>	Withdrawn 10 <i>W</i>	1 0 0 16 <i>W</i>	.....	.....
2	Do.	10 0 0 60 <i>F</i>	10 0 0 11½ <i>F</i>	.....	.....	.....
3	Do.	10 0 0 66 <i>F</i>	5 0 0 64 <i>F</i>	1 0 0 9½ <i>W</i>	5 0 0 (<i>Skimmed Milk</i>) 8 <i>W</i>	10 0 0 2 0 0 1 0 0 5 0 0
4	Do.	0 10 0 6½ <i>W</i> & 5 <i>F</i>	2 0 0 9 <i>W</i>	.....	.....	.....
5	Do.	3 0 0 (Refusing)	10 0 0 9 <i>W</i>	5 0 0 56 <i>F</i>	.....	.....
6	Do.	2 0 0 11 <i>W</i>	2 cases Withdrawn (Farmer fined) 20 <i>F</i> each	2 0 0 10 <i>W</i> & 17 <i>F</i>	5 0 0 44 <i>F</i>	.....
7	Do.	2 0 0 5 <i>W</i>	Withdrawn 11½ <i>W</i>	6 0 0 1½ <i>W</i> & 15 <i>F</i>	10 0 0 2 <i>W</i> & 33 <i>F</i>	.....
8	Do.	3 0 0 10 <i>W</i> & 25 <i>F</i>	1 0 0 5 <i>W</i>	.....	.....	.....
9	Do.	1 1 0 24 <i>W</i>	1 1 0 30 <i>F</i>	.....	.....	.....
10	Do.	1 0 0 10 <i>W</i>	5 0 0 (Refusing)	15 0 0 30 <i>W</i>	.....	.....
11	Do.	2 0 0 (Refusing)	Withdrawn (Farmer fined) 8 <i>F</i>	2 10 0 12 <i>W</i>	5 0 0 8 <i>W</i>	.....
12	Do.	2 0 0 10 <i>W</i>	Withdrawn (Farmer fined) 7 <i>W</i>	2 0 0 5 <i>W</i>	.....	....
13	Do.	1 0 0 40 <i>F</i>	1 0 0 7 <i>W</i>	5 0 0 (Refusing)	.....	.....
14	Do.	1 1 0 8½ <i>W</i>	5 0 0 14 <i>W</i>	2 0 0 12 <i>W</i>	1 10 0 8 <i>W</i>	2 0 0 20 0 0
15	Do.	10 0 0 20 <i>W</i>	5 0 0 13 <i>W</i>	5 0 0 10 <i>W</i>	.....	.....

The figures in *Italic* denote the percentage of water added and fat abstracted

FARMERS.

No.	Article	1st Offence	2nd Offence	3rd Offence	4th Offence	5th Offence	6th Offence	7th Offence	8th Offence	9th Offence	10th Offence	In County
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
16	Milk	4 0 0 7 <i>W</i>	10 0 0 4½ <i>W</i>	20 0 0 10 <i>W</i>	Dis- missed 9½ <i>W</i>	Dis- missed 8 <i>W</i>	...	...	...	...	...	15 0 0 (Strange- ways)
		<i>Heard same day</i>		<i>Heard same day</i>		<i>Heard same day</i>						
17	Do.	5 0 0 12 <i>W</i>	Costs only 26 <i>W</i>	Dis- missed 4½ <i>W</i>	Dis- missed 6½ <i>W</i>	3 0 0 10½ <i>W</i>	3 0 0 11½ <i>W</i>	...	...	...	...	...
18	Do.	10 0 0 33 <i>F</i>	2 cases 20 0 0 28 <i>F</i> 28 <i>F</i>	...	...	...	...	...	...	...	...	...
19	Do.	15 0 0 (In 2 cases) 20 <i>F</i> 20 <i>F</i>	15 0 0 (In 3 cases) 4½ <i>W</i> 5 <i>W</i> 8 <i>W</i>	...	...	...	...	...	...	...	Hanley, Staffs.	40 0 0 (In 4 cases)
20	Do.	2 cases Dis- missed 4 <i>W</i> & 8 <i>W</i>	Dis- missed 10 <i>W</i>	...	...	...	...	...	...	...	...	2 0 0 Gorton 8 <i>W</i>
21	Do.	2 0 0 (In 3 cases) 6 <i>W</i> 4 <i>W</i> 10 <i>W</i>	4 0 0 (In 2 cases) 8 <i>F</i> 13 <i>F</i>	...	...	...	...	...	...	...	...	...
22	Do.	5 0 0 7½ <i>W</i>	2 0 0 (In 2 cases) 28 <i>F</i> 10 <i>F</i>	...	...	...	...	...	...	...	...	...
23	Do.	10 0 0 (In 2 cases) 10 <i>W</i> 4½ <i>W</i>	1 0 0 (In 4 cases) 16 <i>F</i> 45 <i>F</i> 30 <i>F</i> 31 <i>F</i>	...	...	...	...	...	...	...	...	..
24	Do.	2 0 0 8 <i>W</i>	10 0 0 10 <i>W</i>	5 0 0 (Refus- ing)	...	...	..	...	...	...	...	...
25	Do.	2 0 0 4½ <i>W</i>	2 0 0 (In 2 cases) 9½ <i>W</i> 6 <i>W</i>	...	..	...	...	...	...	...	...	...
26	Do.	4 0 0 (In 2 cases) 28 <i>F</i> 33 <i>F</i>	10 0 0 (In 2 cases) 10 <i>F</i> 10 <i>W</i>	...	...	...	...	...	...	...	...	..

The figures in *Italic* denote the percentage of water added and fat abstracted,

FARMERS—continued.

No.	Article	1st Offence	2nd Offence	3rd Offence	4th Offence	5th Offence	6th Offence	7th Offence	8th Offence	9th Offence	10th Offence	In County
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
27	Milk	15 0 0 <i>30 W</i>	20 0 0 <i>39 W</i>	10 0 0 (Refus- ing)	10 0 0 (Refus- ing)	10 0 0 <i>14 W</i>	5 0 0 (Refus- ing)	20 0 0 <i>14 W</i>	20 0 0 <i>12 W</i>	10 0 0 <i>15 W</i>	10 0 0 <i>8 W</i>	20 0 0 (Strange- ways)
28	Do.	2 0 0 <i>12 F</i>	5 0 0 <i>4½ W</i> <i>15 F</i>	...	...	...	...	...	...	...	...	...
29	Do.	2 0 0 (In 2 cases) <i>20 W</i> <i>29 W</i>	2 0 0 <i>23 W</i>	...	...	...	...	...	...	...	...	...
30	Do.	4 0 0 (In 2 cases) <i>7 W</i> <i>10 W</i>	5 0 0 (In 2 cases) <i>8 W</i> <i>8 W</i>	...	...	...	...	...	...	...	...	...
31	Do.	5 0 0 <i>20 F</i>	5 0 0 <i>13 W</i>	...	...	...	...	...	...	...	...	...
32	Do.	1 0 0 <i>10 F</i>	5 0 0 <i>20 F</i>	10 0 0 <i>6 W</i>	2 cases 5 0 0 <i>10 W</i> <i>6 W</i>	5 0 0 <i>12 F</i>	2 0 0 <i>6 W</i>	...	...	...	...	..
33	Do.	3 0 0 <i>12½ W</i>	5 0 0 <i>8 W</i>	...	...	...	...	...	...	...	...	...
34	Do.	15 0 0 (In 3 cases) <i>7 W</i> <i>12 W</i> <i>11 W</i>	10 0 0 <i>20 W</i>	...	...	...	...	...	...	...	...	...
35	Do.	2 0 0 <i>10 F</i>	5 0 0 <i>11 W</i>	5 0 0 <i>11 W</i>	3 cases 20 0 0 <i>11 W</i> <i>15 W</i> <i>15 W</i>	...	...	...	...	...	Altr'ne- ham Salford Do.	Dis- missed 2 0 0 2 0 0
36	Do.	<i>Heard same day</i> 15 0 0 <i>17 W</i>		5 0 0 <i>17 W</i>	...	...	...	...	...	...	Salford L'pool Do.	10 0 0 10 0 0 10 0 0
37	Do.	10 0 0 (In 2 cases) <i>44 F</i> <i>25 F</i>	5 0 0 <i>8½ W &</i> <i>7 F</i>	...	...	...	...	...	...	...	...	...
38	Do.	2 cases 5 0 0 5 0 0 <i>7 W</i> <i>10 W</i>	2 cases 10 0 0 10 0 0 <i>16 W</i> <i>13 W</i>	...	...	...	...	...	...	...	...	...
39	Do.	2 cases 1 0 0 1 0 0 <i>17 F</i> <i>20 F</i>	10 0 0 <i>7 W</i>	..	...	...	...	...	...	...	...	...

The figures in *Italic* denote the percentage of water added and fat abstracted.

BUTTER CASES.

No.	1st Offence	2nd Offence	3rd Offence	4th Offence
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
40	Costs only July 19th, 1878 (Butterine)	2 0 0 Dec. 7th, 1887 (Butterine)	Withdrawn Jan. 11th, 1893 (Excess Water) <i>10 per cent.</i>	Withdrawn Jan. 11th, 1893 (Excess Water) <i>8½ per cent.</i>
41	2 0 0 Jan. 13th, 1886 (Butterine)	1 0 0 Dec. 7th, 1887 (Butterine)	....	....
42	2 0 0 April 16th, 1884 (Butterine)	2 0 0 Jan. 15th, 1886 (Butterine)	Costs only Jan. 10th, 1894 (Packet not marked Margarine)	....
43	2 0 0 April 16th, 1884 (Butterine)	3 0 0 Dec. 22nd, 1886 (Butterine)	3 0 0 March 5th, 1890 (Margarine)	3 0 0 March 5th, 1890 (Margarine)
44	2 0 0 May 21st, 1884 (Butterine)	5 0 0 Jan. 13th, 1886 (Butterine)	5 0 0 Dec. 7th, 1887 (Butterine)	....
45	0 10 0 Dec. 7th, 1887 (Butterine)	Dismissed March 14th, 1894 (Excess Water) <i>6 per cent.</i>	Dismissed March 14th, 1894 (Excess Water) <i>5½ per cent.</i> -
46	2 0 0 March 31st, 1886 (Butterine)	1 1 0 May 2nd, 1888 (Margarine)	....	....
47	Dismissed April 8th, 1885 (Butterine)	2 0 0 Dec. 7th, 1887 (Butterine)	....	....
48	Do.	Do.	....	....
49	2 0 0 April 16th, 1884 (Butterine)	10 0 0 Nov. 13th, 1889 (Margarine)	....	....
50	1 1 0 Dec. 7th, 1887 (Butterine)	2 0 0 April 17th, 1889 (Margarine)	....	....
51	5 0 0 March 21st, 1888 (Margarine)	Withdrawn Jan. 11th, 1893 (Excess water) <i>9 per cent.</i>	....	....
52	0 5 0 March 13th, 1889 (Margarine)	Dismissed Jan. 23rd, 1894 (Excess Water) <i>11½ per cent.</i>	....	....
53	0 5 0 Oct. 3rd, 1888 (Margarine)	Dismissed March 14th, 1894 (Excess Water) <i>7 per cent.</i>	....	....

The figures in *Italic* denote the percentage of water added and fat abstracted.

BUTTER CASES—*continued.*

No.	1st Offence	2nd Offence	3rd Offence	4th Offence
	£ s. d.	£ s. d.	£ s. d.	
54	1 0 0 Nov. 23rd, 1892 (Margarine)	2 0 0 Oct. 20th, 1897 (Margarine)	5 0 0 March 8th, 1899 (Foreign Fat) <i>80 per cent.</i>	....
55	1 0 0 Nov. 21st, 1894 (Margarine)	10 0 0 July 26th, 1899 (Margarine)	....	....
56	2 0 0 April 1st, 1896 (Margarine)	3 0 0 Dec. 1st, 1897 (Margarine)	....	....

The figures in *italic* denote the percentage of water added and fat abstracted.

CANAL BOATS ACTS.

The number of canal boats on the register is 447.

The number inspected was 2,266, resulting in four infringements of the Act being discovered, which were referred to the Justices to be dealt with; in three cases fines were imposed amounting in the aggregate to 15s., and the costs £1 12s. 6d., and one case was withdrawn.

One hundred and three caution notices were sent to the owners and masters.

OFFENSIVE TRADES.

The number of offensive trades on the register is 675. These have been placed under close supervision, and periodical visits paid.

UNHEALTHY DWELLINGS.

During the year, 869 houses were certified to be dealt with by the Sanitary Committee.

Of these, 793 were ordered to be closed.

A large proportion of these houses have since had structural alterations made to them which satisfied the requirements of the Medical Officer of Health, and have since been allowed to be reinhabited.

CLOSET ACCOMMODATION TO WORKSHOPS, WAREHOUSES, &c.

One hundred and forty-seven properties were reported as being deficient in closet accommodation, and 129 public and beer houses as being without or having unsatisfactory urinal accommodation.

In a large number of cases the necessary accommodation has been provided, and in others orders have been made to provide the necessary accommodation, or the reports are under consideration.

DRAINAGE WORK DONE BY THE HOUSE DRAINAGE DEPARTMENT.

During the year 437 cases of non-compliance with Notices have been referred by the District Sanitary Inspectors to the House Drainage Department to carry out the necessary work; 113 requests have been received from owners without notice having been served, and 1,063 orders from other Departments of the Corporation to execute work.

The whole of these included 5,511 private houses and 808 business premises.

The cost of the work executed amounted to the sum of £28,714 11s. 11d., which was apportioned as follows: £21,901 10s. 7d. to the Owners, and £6,813 1s. 4d. to the Highways and City Fund Account.

PARTICULARS RELATING TO THE OPERATIONS OF THE CLEANSING COMMITTEE.

Cleansing Department,

Town Hall, Manchester,

August 2nd, 1901.

Dear Sir,—There are within the City, pail-closets, 74,240; ash-boxes, 62,440; midden privies, 21,825; wet middens, 11,301; dry middens, 743; water-closets, 42,696; and cesspools, 90. The pail-closets are systematically emptied at regular intervals—once, twice, or thrice weekly, as necessity demands. The midden-privies are emptied as required. The contents of the pail-closets are taken to Holt Town and Water Street. At Holt Town the fæcal matter is dried into concentrated manure. The dry refuse is consumed in the Galloway boilers, and generates the steam required for working the machinery. The worthless fine ash, which cannot be consumed, is deposited at the nearest tip at Clayton Bridge. The privy refuse and fæcal matter which is taken to Water Street is sent away in its crude state as night-soil to Carrington and Chat Moss Estates and to farmers in Cheshire. Dry combustible matter is passed into the destructor furnaces or under the Galloway boilers at Water Street, and there destroyed. A large quantity of fine ash at Water Street is used as an absorbent for the fæcal matter from the pail-closets.

The market garbage, of which we have 5,669 tons per annum, is carted to Water Street, and there either destroyed in the furnaces or loaded into boats and sent away to farmers and Carrington and Chat Moss Estates immediately. Slaughter-house refuse is collected from the abattoirs and private slaughter-houses and sent to Holt Town, where it is passed through dryers, and evaporated to dryness; the dry material is then added to our concentrated manure. Street sweepings are generally deposited at the nearest depot, and after being allowed to drain are carted to the nearest tip, or to the Water Street Depot, from whence they are sent away by boat to farmers or the Committee's Estates.

The total quantity of material collected by this Department during the past year amounted to 356,367 tons.

We have within the City about 60 destructor furnaces of different kinds, and last year 15,354 tons of mortar was made from the clinker which is obtained from such furnaces.

We employ nearly 100 "orderly" boys, who collect horse-droppings and litter from the street, and deposit the same in the bins which are fixed in the footpaths. The contents of the bins are removed twice daily, and taken to the nearest depot.

With regard to the removal of the contents of the pails from Typhoid Fever cases: Acting upon instructions we received from you, special pails and lids are supplied for all cases of Enteric Fever; labels are attached to the pails, asking the occupants to use disinfectants, which are supplied with the pails; the pails are left in the yard, and not placed in the ashplace. The occupants of the houses are requested to use this special pail for the reception of the fæcal matter and washings from the patient only. The pails are removed periodically in a specially constructed vehicle, and taken to Holt Town Depot, where the contents are destroyed.

With regard to the cleansing of passages, we have a staff of about 40 men engaged specially upon this work. They regularly, at least once a week, cleanse the back passages in certain districts, and during last year 270,590 swillings and cleansings were effected in courts and passages.

During the year 61,065 barrels of water were used in degging the streets, and 259,854 grids were unstopped.

During the past ten years we have deposited upon the various tips within the City the following quantities of material, viz.:—In 1892, 99,866 tons; 1893, 109,078 tons; 1894, 103,949 tons; 1895, 113,836 tons; 1896, 107,883 tons; 1897, 99,658 tons; 1898, 96,635 tons; 1899, 104,481 tons; 1900, 95,138 tons; and in 1901, 64,781 tons. The bulk of this material was deposited on the tips at Clayton and Harpurhey. It is composed principally of dry ashes, street sweepings, and bell-dust. Occasionally the contents of dry middens are sent there. During last year 23,303 tons of material was sent to Carrington Estate and 78,227 to Chat Moss Estate.

Yours faithfully,

G. PLANT,

Superintendent.

Dr. Niven,

Medical Officer of Health,

Town Hall, Manchester.

REPORT WITH REFERENCE TO UNWHOLESOME MEAT, FISH, &c.

To Dr. Niven,
Medical Officer of Health.

City Abattoirs,
February 15th, 1901.

Sir,—I herewith submit the following report with reference to unwholesome meat, fish, etc., condemned and destroyed in this City under the Public Health Act of 1875, during the year ending December 31st, 1900:—

Meat and Fish.

Beef	152,928 lbs.
Mutton.....	6,053 „
Veal	2,570 „
Pork	18,047 „

Total.....179,598 lbs.

Fish	114,962 lbs.
Shellfish	31,078 „

Total.....146,040 lbs.

Rabbits	5,259 head
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Game.

Hares	753 head
Partridge	54 „
Grouse	64 „
Ptarmigan	192 „
Pheasants.....	3 „
Hazel Hens.....	158 „
Quails	50 „
Wood Pigeons.....	31 „

Poultry.

Turkeys	334 head
Geese	101 „
Ducks	52 „
Chickens	6,576 „
Pigeons	171 „

Miscellaneous.

Fruit.

Bananas	399 cases
Tomatoes	16 „
Pears.....	{ 132 „
	{ 13 hampers
	{ 14 barrels

Miscellaneous, Fruit—continued.

Apples	{ 3 barrels
	{ 2 hampers
Plums	2582 baskets
Cherries	260 „
Sloes	35 „
Blackberries	29 „
Black Currants.....	28½ „
Red Currants	16 „
Strawberries	221 „
Raspberries	13 kegs
Grapes	4 barrels
Damsons	2 pots

Vegetables.

Kidney Beans	290 bags
Onions	27 „
Parsley	6 hampers
Vegetable Marrows ...	2 crates
Lettuce.....	½ crate
Cress.....	18 hampers
Mushrooms	1 basket
Asparagus.....	16 bundles

Eggs	5 cases
Cream	2 tins
Milk	1 can
Yeast	80 bags
Lobster	2071 tins
Condensed Milk	381 „
Tomatoes	43 „
Apricots	26 „
Pine Apple.....	11 „
Peaches	4 „
Sardines	3 „

With the exception of 13,649 lbs. of meat, 696 lbs. of fish, 3 head of poultry, and tinned foods, which were seized while deposited or exposed for the purpose of sale, the above quantities were surrendered by the trade after being condemned by the inspectors.

The number of carcasses, portions of carcasses, consignments of fish, etc., condemned during the year has been 1,747, from the following causes :—

Decomposing	1,082	Swine Fever	3
Tuberculosis	294	Tumours	2
Unmarketable	60	Choked	2
Smothered	52	Peritonitis.....	2
Emaciation	49	Injured and Dropsy	2
Injured.....	41	Blood Poison.....	2
Abscesses.....	26	Gastritis	2
Inflammation	26	Parasitic.....	2
Dropsy	20	Cirrhosis	1
Fevered	18	Unclean.....	1
Hydatids	15	Wood tainted	1
Black quarter	8	Septicæmia	1
Actinomycosis	6	Emaciation and Dropsy ...	1
Parturient Fever	6	Fever and Medicine	1
Pericarditis	5	Fever and Tuberculosis ...	1
Flukes	5	Joint disease	1
Milk Fever	4	Injured and Wasted	1
Pleurisy	4		

Of the meat, fish, etc., there was condemned :—

In the Abattoirs and Carcase Markets 154,312 lbs.
(95,581 lbs. of which was dressed meat con-
signed from places other than the City).

„ Pig Market.....	8,631	„
„ Private Slaughter-houses	9,942	„
„ Private Piggeries	1,036	„
„ Railway Stations.....	2,896	„
„ Shops	1,325	„
In a Sausage Factory	592	„
At a Farm	196	„
At the Pomona Docks	200	„
In a Cart in Stable Yard	408	„
In the Cold Air Stores.....	1,222	„
„ Rusholme Abattoirs	105	„
„ Triperies	410	„
„ Private Stores.....	297	„
„ Fish Markets.....	144,066	„

The game, poultry, and rabbits were condemned principally in the Wholesale and Retail Fish and Poultry Markets and the Cold Air Stores; the fruit and vegetables in the Smithfield Market and on hawkers' carts; and the miscellaneous tinned food at a provision warehouse.

Fourteen orders for the destruction of unsound food have been obtained at the City Police Courts during the year.

There have been seven prosecutions under Section 116 of the Public Health Act, 1875, and in each instance a fine has been imposed, amounting in the aggregate to £47 and costs; and in one case a slaughter-house license was revoked.

In addition to the inspection at the Abattoirs and Markets, 3,051 visits have been made to the private slaughter-houses (125 being at the request of the butchers), and 8,913 carcasses examined; 21 carcasses, and portions of 26 others, being condemned as unfit for human food.

Twenty-three seizures of unwholesome food have been made in shops in the poorer districts of the City—five being on Sundays.

Diseases of Animals.

During the year there have been two outbreaks of glanders in the City, four horses being affected with the disease, and slaughtered. Their total value was £102. One of the animals was tested with mallein, and re-acted to the inoculation. Post-mortem examination confirmed the accuracy of the test.

Four outbreaks of swine fever have occurred, and have been dealt with by the Board of Agriculture.

Two railway companies have been cautioned, in writing, for neglecting to cleanse their horse boxes, as required by Articles 15 and 16 of the "Animals (Transit and General) Order of 1895."

ALFRED HOLBURN, M.R.C.V.S.,

Chief Inspector.

TABLES.

TABLE A, 1900—continued.

CAUSES OF DEATH	AGES AT DEATH													
	All Ages	UNDER 5 YEARS		5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and upwards
		0 to 1	1 to 5											
III.—Dietetic Diseases.														
Starvation, Want of Breast Milk	1	...	...	...	...	...	...	...	...	1	...	...	...	...
Scurvy	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Intem: { Chronic Alcoholism	93	...	...	...	...	...	...	12	34	30	13	4	...	...
Delirium Tremens	10	...	...	...	...	...	1	3	4	1	1	...	...	...
IV.—Constitutional Diseases.														
Rheum: Fev: Rheum: of Heart	28	1	1	5	2	2	3	4	3	4	2	1	...	...
Rheumatism	39	...	...	2	3	3	1	1	5	6	8	9	1	...
Gout	1	...	...	...	...	...	...	...	...	1	...	...	...	...
Rickets	59	22	34	2	...	1	...	...	...	...	...	...	...	...
Cancer	412	...	1	2	5	1	4	21	73	109	115	62	19	...
Tabes Mesenterica	93	50	39	4	...	...	...	...	...	...	...	...	...	...
Tuberc: Mening: (Hydroceph:)	122	34	58	15	5	2	1	2	2	1	1	1	...	...
Phthisis	1,135	2	16	16	29	52	109	252	317	243	68	31	...	...
Other forms of Tuberc: Scrofula	207	62	57	19	10	8	4	20	12	6	6	2	1	...
Purpura, Hæmorrhagic Diathesis	6	3	1	...	...	1	...	...	...	...	...	1	...	...
Anæmia, Chlorosis, Leucocy : .	38	1	1	...	1	3	7	3	3	6	9	4	...	...
Diabetes Mellitus	39	...	...	...	2	4	1	4	4	7	13	4	...	...
Other Constitutional Diseases	1	...	...	...	...	...	...	...	...	1	...	...	...	...
V.—Developmental Diseases.														
Premature Birth	342	342	...	...	...	...	...	...	...	...	...	...	...	...
Atelectasis	18	18	...	...	...	...	...	...	...	...	...	...	...	...
Cyanosis	22	19	3	...	...	...	...	...	...	...	...	...	...	...
Spina Bifida	10	10	...	...	...	...	...	...	...	...	...	...	...	...
Imperforate Anus	5	5	...	...	...	...	...	...	...	...	...	...	...	...
Cleft Palate Harelip	3	3	...	...	...	...	...	...	...	...	...	...	...	...
Other Congenital Defects	21	21	...	...	...	...	...	...	...	...	...	...	...	...
Old Age	225	...	...	...	...	...	...	...	...	...	11	75	108	31
VI.—Local Diseases.														
1.—NERVOUS SYSTEM(DIS: OF).														
Inflam: of Brain or its Mem: ...	173	54	58	22	3	4	2	9	12	3	4	1	1	...
Apoplexy	306	...	...	...	1	2	1	8	29	63	98	71	29	4
Softening of the Brain	27	...	...	...	...	...	...	...	2	4	8	6	6	1
Hemiplegia, Brain Paralysis	94	...	1	...	1	...	...	2	6	13	31	28	10	2
Paralysis Agitans	4	...	...	...	...	...	...	...	...	...	1	3	...	...
Insanity, Gen: Par: of Insane...	198	...	...	...	...	4	1	10	25	42	43	46	26	1
Chorea	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Epilepsy	34	...	...	2	1	...	3	6	11	5	4	1	...	1
Convulsions	187	154	33	...	...	...	...	...	...	...	...	...	...	...
Laryngismus Stridulus	12	6	6	...	...	...	...	...	...	...	...	...	...	...
Idiopathic Tetanus	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Paraplegia, Dis: of Spinal Cord	34	1	1	...	...	...	3	3	2	10	9	5	...	...
Other Diseases of Nervous Sys:	74	2	1	3	2	1	1	5	19	22	15	3	...	...
2. ORGANS OF SPECIAL SENSE (DISEASES OF).														
Otitis, Otorrhœa	16	4	3	3	...	3	...	...	3	...	...	...	...	...
Epistaxis and Disease of Nose	1	...	...	...	...	1	...	...	...	...	...	...	...	...
Ophthalmia and Disease of Eye.	3	2	1	...	...	...	...	...	...	...	...	...	...	...
3. CIRCULATORY SYS: (DIS: OF)														
Endocarditis	27	...	3	1	...	1	6	3	3	4	2	4	...	...
Valvular Disease	225	...	...	5	4	9	7	30	39	37	43	44	7	...
Pericarditis	21	2	3	1	2	1	1	2	2	3	4	...	...	...
Hypertrophy of Heart	1	...	...	...	...	...	...	...	...	1	...	...	...	...
Angina Pectoris	7	...	...	...	...	...	...	...	1	3	2	1	...	...
Syncope	103	7	1	...	...	...	1	1	10	11	13	26	26	7

TABLE A, 1900—*continued*.

CAUSES OF DEATH	AGES AT DEATH													
	All Ages	UNDER 5 YEARS		5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and upwards
		0 to 1	1 to 5											
3. CIRCULATORY SYS: (DIS: OF) (continued)														
Aneurism	20	...	...	...	...	...	...	3	5	7	4	1	...	...
Senile Gangrene	32	...	...	...	...	...	...	...	1	1	4	22	4	...
Embolism, Thrombosis	40	...	...	1	1	...	3	4	5	7	10	6	2	1
Phlebitis.....	3	...	...	...	...	...	...	...	2	...	...	...	1	...
Varicose Veins	1	...	...	...	...	...	...	1	...	...	...	...	...	...
Other Dis : of Circulatory Sys :	650	2	5	8	9	10	15	38	79	145	192	118	29	...
4. RESPIRATORY SYS: (DIS: OF)														
Laryngitis	25	2	20	3	...	...	...	...	...	...	...	...	...	...
Croup	10	2	6	2	...	...	...	...	...	...	...	...	...	...
Other Dis: of Larynx and Trachea	1	...	1	...	...	...	...	...	...	...	...	...	...	...
Emphysema, Asthma	25	...	...	...	...	...	1	1	3	3	15	2	...	...
Bronchitis	1,355	305	135	9	4	3	3	17	63	135	237	288	145	11
Pneumonia.....	1,624	297	339	46	15	36	42	123	192	177	199	121	37	...
Pleurisy	39	...	...	4	1	2	3	7	8	3	7	4	...	...
Other Dis: of Resp: System ...	57	9	8	3	...	...	1	2	3	6	10	8	7	...
5. DIGESTIVE SYS: (DIS: OF).														
Stomatitis	20	13	6	...	1	...	...	...	...	...	...	...	...	...
Dentition	81	52	29	...	...	...	...	...	...	...	...	...	...	...
Sore-throat, Quinsy.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dyspepsia	15	7	1	...	...	...	...	...	1	1	2	1	2	...
Hæmatemesis .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Melæna .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Diseases of Stomach	95	45	10	2	1	2	4	4	5	6	6	8	2	...
Enteritis.....	88	58	10	1	...	2	...	2	...	3	5	5	1	1
Ulceration of Intestine	6	...	1	1	...	1	...	...	1	1	1	...	...	...
Ileus, Obstruction of Intestine..	34	2	2	1	3	2	...	4	5	4	7	1	3	...
Strict: or Strang: of Intestine...	3	1	1	...	...	...	...	...	...	...	...	...	1	...
Intussusception of Intestine ...	6	3	...	1	...	...	...	...	1	1	...	...	...	...
Hernia	25	5	1	1	...	...	...	...	4	4	6	2	2	...
Fistula	2	...	1	...	...	...	1	...	...	...	...	...	...	...
Peritonitis	48	4	3	3	5	1	5	9	6	9	3	...	...	...
Ascites .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gallstones	7	...	...	...	...	...	1	...	1	1	3	...	1	...
Cirrhosis of Liver.....	127	...	...	...	...	...	...	6	28	51	32	9	1	...
Other Diseases of Liver	39	8	...	...	...	...	1	2	5	11	6	4	2	...
Other Dis: of Digestive System	29	6	3	...	2	4	1	2	3	...	6	2	...	...
6. LYMPH: SYS: AND DUCTLESS GLANDS (DIS: OF).														
Diseases of Lymphatic System.	6	...	1	1	...	1	...	...	...	1	2	...	...	...
Diseases of Spleen	1	...	...	...	...	...	...	1	...	...	...	...	...	...
Bronchocele	3	...	1	...	...	...	1	...	1	...	...	...	...	...
Addison's Disease.....	7	...	...	...	...	...	...	1	1	4	...	1	...	...
7. URINARY SYSTEM (DIS: OF).														
Acute Nephritis	45	2	6	6	2	...	3	6	9	7	3	1	...	...
Bright's Disease	157	...	...	...	...	2	4	12	35	40	34	23	7	...
Uræmia	12	...	...	...	...	...	1	1	4	1	1	2	2	...
Suppression of Urine .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Calculus .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hæmaturia.....	1	...	...	...	...	...	...	...	...	...	...	1	...	...
Dis: of Bladder and Prostate ...	26	...	...	...	...	...	1	1	4	4	4	6	3	3
Other Dis: of Urinary System..	19	1	...	...	...	...	...	...	7	2	6	3	...	...
8. REPRODUCTIVE SYSTEM (DISEASES OF).														
(a) Generative Organs (Dis: of):														
Ovarian Disease	10	...	...	...	...	...	1	...	1	1	5	2	...	...
Diseases of Uterus and Vagina.	7	...	...	...	...	...	...	...	3	1	1	2	...	...
Disorders of Menstruation	2	...	...	...	...	...	...	...	2	...	...	...	...	...

TABLE A, 1900—concluded.

CAUSES OF DEATH	AGES AT DEATH													
	All Ages	UNDER 5 YEARS		5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and upwards
		0 to 1	1 to 5											
8. REPRODUCTIVE SYSTEM (DIS: OF)— <i>continued</i> .														
Pelvic Abscess	6	...	...	...	...	...	...	2	2	I	I	...	...	...
Perineal Abscess .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dis: of Testes, Penis, Scrotum, &c.	3	...	...	...	...	...	...	2	I	...	...	...	...	...
(b) Parturition, Diseases of:														
Abortion, Miscarriage	6	...	...	...	...	...	I	4	I	...	...	...	...	...
Puerperal Mania	2	...	...	...	...	...	I	I	...	...	...	...	...	...
Puerperal Convulsions	7	...	...	...	...	...	3	3	I	...	...	...	...	...
Placenta Prævia, Flooding	7	...	...	...	...	...	...	6	I	...	...	...	...	...
Phlegmasia Dolens	2	...	...	...	...	...	...	I	I	...	...	...	...	...
Other Accidents of Childbirth...	5	...	...	...	...	...	...	I	4	...	...	...	...	...
9. LOCOMOTOR SYS; (DIS: OF).														
Caries, Necrosis	17	...	5	3	2	...	2	I	2	...	I	I	...	...
Arthritis, Ostitis, Periostitis.....	4	2	...	...	...	...	...	...	...	...	I	I	...	...
Other Dis: of Locom: Sys:	4	...	...	...	I	I	I	...	...	...	...	I	...	...
10. INTEGUMENTARY SYSTEM (DISEASES OF).														
Carbuncle	2	...	...	...	...	...	...	...	...	...	...	I	I	...
Phlegmon, Cellulitis	4	I	...	...	...	I	...	...	...	I	I	...	...	...
Lupus .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ulcer, Bedsore	6	...	...	...	...	...	...	...	...	...	...	...	...	...
Eczema	2	I	I	...	...	...	...	I	...	I	I	2	I	...
Pemphigus.....	2	I	...	...	...	...	...	...	...	...	...	...	...	...
Other Dis: of Integ: Sys:	I	I	...	...	...	...	...	...	...	...	...	I	...	...
VII.—Violence.														
1. ACCIDENT OR NEGLIGENCE.														
Fractures, Contusions	167	3	11	10	6	5	11	16	21	22	31	20	10	I
Gunshot Wounds .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cut, Stab .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Burn, Scald	72	4	41	12	3	2	I	I	I	4	I	2	...	...
Poison	12	...	I	...	...	I	I	...	3	5	I	...	...	...
Drowning	30	...	2	3	I	I	...	I	10	7	3	2	...	...
Suffocation.....	88	78	5	...	I	...	I	2	...	...	...	I	...	...
Otherwise	6	I	...	...	...	I	...	...	2	I	I	...	...	...
2. HOMICIDE.														
Murder, Manslaughter.....	4	I	...	...	...	...	...	...	2	I	...	...	...	...
3. SUICIDE.														
Gunshot Wounds	2	...	...	...	...	...	...	I	...	I	...	...	...	...
Cut, Stab	10	...	...	...	...	...	...	I	...	I	...	...	...	...
Poison.....	12	...	...	...	...	...	I	4	2	2	3	...	...	...
Drowning	3	...	...	...	...	...	...	2	...	...	...	I	...	...
Hanging.....	13	...	...	...	...	...	2	3	I	3	2	...	2	...
Otherwise	2	...	...	...	...	...	...	...	I	I	...	...	...	...
4. EXECUTION :—Hanging.														
VIII.—Ill-defined and not Specified Causes.														
Dropsy	3	...	...	...	...	...	...	...	...	I	2	...	...	...
Debility, Atrophy, Inanition ...	665	562	57	...	...	...	...	...	...	...	4	15	22	3
Mortification .....	...	...	...	...	...	...	...	I	I	...	...	...	...	...
Tumour	I	I	...	...	...	...	...	...	...	...	...	...	...	...
Abscess	3	I	...	...	...	...	...	...	...	...	...	...	...	...
Hæmorrhage ..	3	I	...	...	...	...	...	...	...	I	I	...	...	...
Sudden (cause unascertained)...	181	42	11	2	...	2	I	4	23	34	35	20	7	...
Other Ill-def: not spec: causes.	142	46	I	...	...	2	...	6	17	26	25	12	6	I

TABLE B.

1900.—SUMMARY OF TABLE A, COMPARED WITH AVERAGE DEATHS IN GROUPS
OF DISEASES, 1891-99.

	DEATHS	
	1900	Average 1891-99
I. Specific Febrile, or Zymotic Diseases :		
1. Miasmatic Diseases	1,154	1,229
2. Diarrhoeal „	822	759
3. Malarial „ .....	...	...
4. Zoogenous „ .....	...	1
5. Venereal „	80	69
6. Septic „	66	78
II.—Parasitic Diseases.....	2	6
III.—Dietetic Diseases	104	64
IV.—Constitutional Diseases	2,180	2,096
V.—Developmental Diseases	646	641
VI.—Local Diseases :		
1. Diseases of Nervous System	1,143	1,199
2. Diseases of Organs of Special Sense	20	19
3. Diseases of Circulatory System	1,130	951
4. Diseases of Respiratory System	3,136	2,768
5. Diseases of Digestive System	625	553
6. Diseases of Lymphatic System and Duct- less Glands	17	12
7. Diseases of Urinary System	260	268
8. Diseases of Reproductive System :		
(a) Diseases of Generative Organs...	28	28
(b) Diseases of Parturition	29	44
9. Diseases of Locomotor System	25	34
10. Diseases of Integumentary System.....	17	25
VII.—Violence :		
1 Accident or Negligence	375	346
2. Homicide	4	6
3. Suicide	42	42
4. Execution :—Hanging .....	...	...
VIII.—Ill-defined and not Specified Causes...	998	909
TOTAL	12,903	12,147

TABLE C.—MANCHESTER, 1900.

CAUSES OF DEATHS AT DIFFERENT LIFE PERIODS—MALES.

Classes	CAUSES OF DEATH	All Ages Total	AGES AT DEATH—IN YEARS												
			UNDER 5 YEARS		5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and upwards
			0 to 1	1 to 5											
	All Causes.....	6642	1799	868	166	77	111	167	394	682	823	750	547	225	33
I.	Smallpox .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Measles	127	31	88	7	1	..	...	...	...	...	...	...	...	...
	Scarlet Fever	62	1	42	11	5	2	1	...	...	...	...	...	...	...
	Typhus Fever.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Whooping Cough	171	76	88	7	...	...	...	...	...	...	...	...	...	...
	Diphtheria	37	2	22	10	2	...	1	...	...	...	...	...	...	...
	Membranous Croup	14	2	9	3	...	...	...	...	...	...	...	...	...	...
	Ill-defined Fever.....	3	...	...	1	1	1	...	...	...	...	...	...	...	...
	Enteric Fever	49	...	...	2	4	6	7	11	11	4	3	1	...	...
	Influenza	114	3	3	1	1	1	6	13	14	27	19	20	6	...
	Simple Cholera	9	5	1	...	...	1	...	...	1	1	...	...	...	...
	Diarrhœa, Dysentery.....	408	313	70	5	...	1	1	1	2	5	2	6	1	1
	Venereal Affections.....	52	27	5	...	...	...	...	3	7	6	4	...	...	...
	Erysipelas	10	2	...	1	...	...	...	1	1	1	2	1	1	...
II.	Pyæmia	1	...	...	...	...	...	...	1	...	...	...	...	...	...
	Puerperal Fever ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Other Zymotics	1	...	...	...	...	...	...	1	...	...	...	...	...	...
	Parasitic Diseases	1	1	...	...	...	...	...	...	...	...	...	...	...	...
	Dietetic Diseases, Intemperance	61	...	...	...	...	...	1	7	22	20	9	2	...	...
	Rheumatic Fever.....	16	...	1	3	2	1	1	2	2	2	1	1	...	...
	Rickets	39	15	22	2	..	...	...	...	...	...	...	...	...	...
	Cancer	156	...	1	...	2	1	1	5	17	51	45	24	9	...
	Tabes Mesenterica.....	42	21	19	2	...	...	...	...	...	...	...	...	...	...
	Hydrocephalus	60	22	23	6	2	1	1	2	1	1	1	...	...	...
	Phthisis.....	695	...	7	5	9	27	59	136	210	166	53	23	...	...
	Scrofula, Tuberculosis	119	35	33	12	6	5	2	10	8	3	3	1	1	...
	Constitutional Diseases (other)...	44	3	1	...	3	7	2	2	4	9	10	3	...	...
	Premature Birth.....	193	193	...	...	...	...	...	...	...	...	...	...	...	...
	Malform. Develop. Dis. (other)...	44	42	2	...	...	...	...	...	...	...	...	...	...	...
	Old Age	81	...	...	...	...	...	...	...	...	...	2	29	36	14
V.	Apoplexy, Hemiplegia	169	...	...	...	1	1	...	4	18	35	46	46	16	2
	Epilepsy	20	...	...	2	...	...	1	2	6	4	3	1	...	1
	Convulsions	95	76	19	...	...	...	...	...	...	...	...	...	...	...
	Brain and Nervous Dis. (other)...	276	33	43	15	3	2	5	14	22	42	45	37	14	1
	Heart Diseases	509	10	8	7	6	9	14	33	58	112	129	95	24	4
	Croup	4	1	2	1	...	...	...	...	...	...	...	...	...	...
	Bronchitis	649	165	70	5	4	2	2	8	26	71	107	120	64	5
	Pneumonia	956	168	163	24	5	28	31	75	130	122	128	65	17	...
	Respiratory Diseases (other).....	76	5	11	5	1	...	4	7	8	7	18	7	3	...
	Digestive Organs (Diseases of)...	298	117	33	5	11	5	4	14	25	35	29	11	8	1
	Urinary Organs (Diseases of) ...	158	2	1	5	1	1	5	10	38	35	30	21	6	3
	Reproductive Organs (Dis. of)...	1	...	...	...	...	...	...	...	...	...	1	...	...	...
	Local Diseases (other)	37	7	8	4	3	3	3	3	2	1	1	...	2	...
	Violence	249	43	35	14	4	4	15	25	33	35	26	11	4	...
	Marasmus, Atrophy	379	329	29	...	...	...	...	1	...	...	3	7	9	1
	Other Ill-defined Causes	157	49	9	1	...	2	1	2	16	28	30	15	4	...

TABLE D.—MANCHESTER, 1900.
CAUSES OF DEATHS AT DIFFERENT LIFE PERIODS—FEMALES.

Classes	CAUSES OF DEATH	All Ages Total	AGES AT DEATH—IN YEARS												
			UNDER 5 YEARS		5	10	15	20	25	35	45	55	65	75	85 and upwards
			0 to 1	1 to 5	to 10	to 15	to 20	to 25	to 35	to 45	to 55	to 65	to 75	to 85	
	All Causes	6261	1516	846	154	75	95	143	383	587	652	778	663	333	36
I.	Smallpox .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Measles.....	127	29	87	11	...	...	...	...	...	...	...	...	...	...
	Scarlet Fever	43	2	28	8	2	...	1	1	1	...	...	...	...	...
	Typhus Fever .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Whooping Cough	200	86	107	7	...	...	...	...	...	...	...	...	...	...
	Diphtheria	39	2	25	9	2	...	...	1	...	...	...	...	...	...
	Membranous Croup	11	2	8	1	...	...	...	...	...	...	...	...	...	...
	Ill-defined Fever.....	2	...	1	1	...	...	...	...	...	...	...	...	...	...
	Enteric Fever	26	...	1	5	4	2	4	3	4	2	1	...	...	...
	Influenza	125	1	6	3	...	3	4	11	8	27	34	18	10	...
	Simple Cholera	5	1	2	...	...	...	...	1	...	1	...	...	...	...
	Diarrhoea, Dysentery.....	400	307	66	1	1	1	...	...	2	7	7	3	5	...
	Venereal Affections.....	28	17	7	...	...	...	1	...	1	...	2	...	...	...
	Erysipelas.....	19	6	1	...	...	...	1	1	1	4	2	3	...	...
	Pyæmia.....	8	1	...	...	...	1	1	2	1	1	1	...	...	...
	Puerperal Fever	28	...	...	...	...	2	8	13	5	...	...	...	...	...
	Other Zymotics	3	2	...	1	...	...	...	...	...	...	...	...	...	...
II.	Parasitic Diseases	1	1	...	...	...	...	...	...	...	...	...	...	...	...
III.	Dietetic Diseases, Intemperance	43	...	...	...	...	...	...	8	16	12	5	2	...	...
IV.	Rheumatic Fever	12	1	...	2	...	1	2	2	1	2	1	...	...	...
	Rickets	20	7	12	...	...	1	...	...	...	...	...	...	...	...
	Cancer	256	...	...	2	3	...	3	16	56	58	70	38	10	...
	Tabes Mesenterica	51	29	20	2	...	...	...	...	...	...	...	...	...	...
	Hydrocephalus	62	12	35	9	3	1	...	...	1	...	...	1	...	...
	Phthisis.....	440	2	9	11	20	25	50	116	107	77	15	8	...	...
	Scrofula, Tuberculosis	88	27	24	7	4	3	2	10	4	3	3	1	...	...
V.	Constitutional Diseases (other)...	80	1	1	2	3	4	7	6	8	12	20	15	1	...
	Premature Birth	149	149	...	...	...	...	...	...	...	...	...	...	...	...
	Malform. Develop. Dis. (other).. Old Age	35 144	34 ...	1...	...	...	...	...	...	...	...	...	...	...	...
VI.	Apoplexy, Hemiplegia	231	...	1	...	1	1	1	6	17	41	83	53	23	4
	Epilepsy	14	...	...	...	1	...	2	4	5	1	1	...	...	...
	Convulsions	92	78	14	...	...	...	...	...	...	...	...	...	...	...
	Brain and Nervous Dis. (other)...	246	30	23	10	2	7	2	13	38	39	35	27	19	1
	Heart Diseases	621	1	4	9	10	12	19	49	89	107	145	127	45	4
	Croup	6	1	4	1	...	...	...	...	...	...	...	...	...	...
	Bronchitis.....	706	140	65	4	...	1	1	9	37	64	130	168	81	6
	Pneumonia	668	129	176	22	10	8	11	48	62	55	71	56	20	...
	Respiratory Diseases (other).....	71	6	18	5	...	2	1	3	6	5	14	7	4	...
	Digestive Organs (Diseases of)...	327	87	35	5	1	7	9	15	35	57	48	21	7	...
VII.	Urinary Organs (Diseases of) ...	102	1	5	1	1	1	4	10	21	19	18	15	6	...
	Reproductive Organs (Dis. of)...	56	...	...	...	...	...	6	20	17	3	6	4	...	...
	Local Diseases (other)	42	5	4	3	...	4	1	1	5	6	5	8	...	...
	Violence	172	44	25	11	7	6	2	6	14	15	17	16	8	1
VIII.	Marasmus, Atrophy	286	233	28	...	...	...	...	...	1	...	1	8	13	2
	Other Ill-defined Causes	176	42	3	1	...	2	...	8	24	34	34	18	9	1

TABLE E.
CITY OF MANCHESTER, 1900.—CAUSES OF DEATH IN INFANCY AND
CHILDHOOD.

CAUSES OF DEATH	UNDER ONE YEAR			Total under One Year	ONE AND UNDER FIVE YEARS				Total under Five Years
	Under 3 months	3-6 months	6-12 months		1-	2-	3-	4-	
All Causes	1,430	745	1,140	3,315	1,005	318	210	181	5,029
Measles .....	...	10	50	60	100	35	25	15	235
Scarlatina	1	...	2	3	14	14	19	23	73
Whooping Cough	28	31	103	162	117	40	21	17	357
Diphtheria..... (Memb: Croup)	1	2	5	8	16	15	16	17	72
Fever (various forms) .....	...	...	...	...	...	...	1	1	2
Diarrhoeal Diseases	132	223	271	626	124	9	1	5	765
Syphilis	25	11	8	44	10	1	...	1	56
Tabes Mesenterica	8	24	18	50	29	8	2	...	89
Hydrocephalus	6	8	20	34	31	14	7	6	92
Scrofula (other).....	8	22	34	64	37	12	15	9	137
Premature Birth	334	8	...	342	...	...	...	...	342
Convulsions	97	30	27	154	23	5	2	3	187
Brain Diseases (other)	10	14	39	63	34	10	16	7	130
Lung Diseases	131	159	325	615	310	106	45	48	1,124
Teething .....	...	3	49	52	28	1	...	...	81
Atrophy, Marasmus	368	113	81	562	45	8	3	1	619
Found Dead in Bed	70	22	9	*101	...	...	...	...	101
Suffocation	4	...	...	4	1	2	1	1	9
Violence (other forms)	3	2	4	9	6	21	15	13	64
Ill-defined Causes.....	38	10	16	64	11	...	1	...	76
Unclassified	166	53	79	298	69	17	20	14	418

* 74 of these were "Found dead in bed, suffocated."

TABLE F, 1871 TO 1900.—MANCHESTER.—ESTIMATED POPULATIONS. ANNUAL RATES OF MARRIAGES, BIRTHS, AND DEATHS
(a) from all causes, and (b) from specified causes; also the percentages to total deaths of Inquest Cases, and of Deaths in Public Institutions.

YEARS	Estimated Populations — (Mean)	Persons Married	ANNUAL RATES PER 1,000 PERSONS LIVING											PERCENTAGES TO TOTAL DEATHS		YEARS		
			Births	Deaths (All Causes)	Smallpox	Measles	Scarlet Fever	Diphtheria	Whooping Cough	Typhus Fever	Enteric Fever	Simple Continued Fever	Diarrhoea and Dysentery	English Cholera	Violence		Inquest Cases	Deaths in Public Institutions
Quinquennial Averages	1871-1875	24.6	38.9	28.3	0.26	0.64	1.08	0.08	0.78	0.14	0.43	0.21	1.92	0.03	0.94	7.2	13.4	1871-1875
	1876-1880	18.6	38.7	26.2	0.24	0.53	1.07	0.13	0.84	0.08	0.29	0.11	1.22	0.04	0.89	7.5	14.3	1876-1880
	1881-1885	17.9	35.1	23.6	0.04	0.71	0.48	0.10	0.68	0.05	0.20	0.03	0.96	0.03	0.72	7.0	15.9	1881-1885
	1886-1890	16.6	33.4	24.6	0.02	0.83	0.50	0.32	0.54	0.02	0.30	0.01	1.06	0.02	0.78	6.9	17.7	1886-1890
	1891-1895	16.9	33.2	23.6	0.03	0.62	0.26	0.27	0.64	0.00	0.24	0.01	1.14	0.05	0.77	7.1	19.2	1891-1895
	1896-1900	18.2	32.5	22.7	...	0.89	0.20	0.13	0.53	0.00	0.18	0.01	1.65	0.04	0.73	7.1	20.2	1896-1900
Ave. 30 yrs. 1871-1900	527,154	18.8	35.3	24.8	0.10	0.70	0.60	0.17	0.67	0.05	0.27	0.06	1.32	0.03	0.80	7.1	16.8	Ave. 30 yrs. 1871-1900
1871	464,866	24.2	38.1	29.3	0.72	0.84	0.71	0.04	0.61	0.20	0.45	0.35	2.58	0.02	0.90	6.3	13.7	1871
1872	471,023	25.8	39.3	27.3	0.32	0.33	1.02	0.09	1.22	0.17	0.40	0.17	2.07	0.04	0.90	6.9	13.5	1872
1873*	477,261	24.8	38.3	28.0	0.08	0.85	1.43	0.05	0.38	0.15	0.46	0.20	1.92	0.05	0.83	7.3	12.8	1873*
1874	483,582	23.8	39.3	28.7	0.05	0.62	1.33	0.07	0.83	0.08	0.39	0.19	1.71	0.01	0.94	7.3	13.5	1874
1875	489,987	24.2	39.5	28.4	0.11	0.54	0.92	0.14	0.88	0.11	0.44	0.12	1.32	0.01	1.12	8.4	13.3	1875
1876	496,476	20.2	40.0	28.0	0.80	0.65	1.13	0.10	0.81	0.16	0.42	0.17	1.50	0.02	1.05	7.4	14.4	1876
1877	503,051	19.8	39.5	26.1	0.36	0.59	1.05	0.13	0.84	0.11	0.29	0.12	0.82	0.01	0.86	7.9	14.9	1877
1878	509,714	18.8	39.7	26.8	0.01	0.45	1.07	0.14	0.68	0.06	0.31	0.10	1.42	0.07	0.91	7.6	14.4	1878
1879*	516,464	16.8	37.3	25.2	0.00	0.35	1.07	0.13	1.09	0.02	0.18	0.07	0.62	0.01	0.81	7.3	14.2	1879*
1880	523,304	17.2	36.9	25.0	0.01	0.63	1.03	0.14	0.76	0.04	0.26	0.07	1.73	0.09	0.80	7.1	13.7	1880
1881	530,051	17.8	35.9	22.8	0.03	0.29	0.34	0.09	0.71	0.03	0.17	0.06	0.73	0.02	0.84	8.1	15.9	1881
1882	536,324	18.8	35.7	24.0	0.05	0.89	0.34	0.11	0.87	0.10	0.25	0.04	1.00	0.03	0.67	7.2	14.5	1882

TABLE F—Continued.

YEARS	Estimated Populations —— (Mean)	Persons Married	ANNUAL RATES PER 1,000 PERSONS LIVING										PERCENTAGES TO TOTAL DEATHS		YEARS			
			Births	Deaths (All Causes)	Smallpox	Measles	Scarlet Fever	Diphtheria	Whooping Cough	Typhus Fever	Enteric Fever	Simple Continued Fever	Diarrhoea and Dysentery	English Cholera		Violence	Inquest Cases	Deaths in Public Institutions
1883	542,671	17.8	34.9	24.4	0.01	0.71	0.81	0.11	0.62	0.05	0.20	0.03	0.95	0.03	0.73	7.0	15.5	1883
1884*	549,093	18.0	34.4	23.4	0.01	0.57	0.74	0.08	0.49	0.03	0.19	0.03	1.46	0.05	0.65	6.2	17.3	1884*
1885	555,591	17.0	34.8	23.6	0.08	1.08	0.17	0.10	0.71	0.04	0.17	0.01	0.64	0.02	0.69	6.4	16.4	1885
1886	562,166	16.4	34.7	24.1	0.00	0.27	0.41	0.15	0.57	0.03	0.29	0.01	1.34	0.04	0.71	7.2	17.0	1886
1887	568,819	16.6	33.9	25.4	0.01	1.54	0.63	0.23	0.50	0.02	0.31	0.01	1.19	0.02	0.77	6.9	16.1	1887
1888	575,550	16.0	33.3	23.3	0.07	0.27	0.42	0.36	0.79	0.02	0.33	0.02	0.71	0.01	0.74	6.7	18.3	1888
1889	582,362	17.0	33.1	24.2	0.00	1.22	0.45	0.51	0.45	0.01	0.31	0.01	1.00	0.03	0.89	6.5	18.2	1889
1890*	589,253	17.0	31.8	26.2	...	0.83	0.60	0.36	0.37	0.01	0.27	0.02	1.04	0.02	0.79	7.0	19.1	1890*
1891†	† 508,673	17.2	33.8	26.0	...	0.43	0.22	0.25	1.02	0.01	0.37	0.01	0.81	0.04	0.79	6.8	18.4	1891†
1892†	† 513,196	17.2	33.4	23.2	0.00	0.72	0.27	0.25	0.72	0.00	0.24	0.01	0.79	0.02	0.77	7.4	18.2	1892†
1893†	† 517,760	16.0	33.4	24.3	0.09	0.57	0.27	0.35	0.46	0.00	0.25	0.01	1.75	0.10	0.76	6.9	18.7	1893†
1894†	† 522,365	16.8	31.8	19.8	0.04	0.42	0.22	0.29	0.55	...	0.17	0.01	0.70	0.02	0.75	7.5	21.3	1894†
1895†	† 527,010	17.4	33.4	24.5	0.00	0.96	0.33	0.21	0.47	...	0.18	0.01	1.66	0.06	0.80	6.9	19.2	1895†
1896†*	† 531,697	18.3	32.8	22.0	...	1.05	0.37	0.15	0.66	0.00	0.22	0.01	1.04	0.02	0.71	7.4	19.7	1896†*
1897†	† 536,426	17.8	32.9	22.4	...	1.17	0.23	0.08	0.56	0.00	0.18	0.00	1.74	0.06	0.68	6.6	20.0	1897†
1898†	† 541,296	18.3	32.3	21.2	...	0.50	0.12	0.09	0.31	...	0.22	0.01	1.96	0.06	0.69	7.0	19.5	1898†
1899†	† 546,010	18.4	32.2	23.9	...	1.28	0.08	0.16	0.42	0.00	0.13	0.01	2.02	0.03	0.78	7.0	19.7	1899†
1900†	† 542,566	18.0	32.4	23.8	...	0.47	0.19	0.19	0.68	...	0.14	0.01	1.49	0.03	0.78	7.4	21.9	1900†

* The facts for these years are for 53 instead of 52 weeks; corrections have, therefore, been made in calculating the rates.
 † The populations and rates for the years subsequent to 1890, except the marriage rates, relate to the City of Manchester as enlarged by the Act of that year. The facts and rates for previous years are those for the three Unions of Manchester, Chorlton, and Prestwich, which have been taken to approximately represent "Manchester."
 ‡ These figures include a proportion of the inmates of certain Extra-municipal Institutions which receive patients from the City of Manchester, and are therefore in excess of the estimates of the Registrar-General.
 NOTE.—The population for 1900 is based on the Census figures of 1891 and 1901.

TABLE G, 1881 TO 1900.—MANCHESTER.
ANNUAL RATES OF MORTALITY FROM CERTAIN CAUSES OF DEATH.

YEAR		ANNUAL RATES PER 1,000 PERSONS LIVING										RATES PER 1,000 BIRTHS	
		Cancer	Tabs Mesenterica	Phthisis	Other Tuber: Diseases	Diseases of Nervous System	Diseases of Circulatory System	Diseases of Respiratory System	Diseases of Digestive System	Diseases of Urinary System	Diseases of Generative System	Puerperal Fever	Childbirth
Quinquennial Periods	1881-1885	0.50	0.35	2.42	0.57	3.28	1.37	5.41	1.23	0.48	0.08	3.03	1.99
	1886-1890	0.64	0.36	2.24	0.59	3.09	1.73	5.76	1.23	0.61	0.08	3.22	2.13
	1891-1895	0.62	0.22	2.09	0.75	2.50	1.75	5.56	1.07	0.52	0.07	2.75	3.42
	1896-1900	0.73	0.19	2.04	0.63	2.02	1.90	5.03	1.04	0.49	0.09	1.55	1.51
Average 20 years	1881-1900	0.62	0.28	2.20	0.64	2.72	1.69	5.44	1.14	0.43	0.08	2.64	2.26
1881		0.48	0.28	2.46	0.52	3.33	1.19	5.57	1.24	0.39	0.07	3.15	1.37
1882		0.44	0.40	2.41	0.61	3.35	1.34	5.33	1.19	0.45	0.08	3.92	1.62
1883		0.54	0.34	2.54	0.59	3.32	1.33	5.66	1.20	0.50	0.06	2.27	1.58
1884*		0.51	0.39	2.34	0.56	3.27	1.44	4.88	1.23	0.59	0.10	2.81	2.55
1885		0.51	0.36	2.34	0.56	3.12	1.53	5.59	1.28	0.49	0.08	3.05	2.84
1886		0.56	0.43	2.44	0.59	3.30	1.53	5.43	1.26	0.57	0.08	2.67	1.85
1887		0.62	0.39	2.19	0.53	3.17	1.66	5.72	1.23	0.53	0.08	3.58	1.35
1888		0.65	0.31	2.14	0.62	3.19	1.72	5.31	1.16	0.62	0.10	4.12	1.77
1889		0.70	0.36	2.12	0.59	2.94	1.79	5.06	1.28	0.64	0.08	3.06	1.87
1890*		0.65	0.33	2.33	0.62	2.87	1.93	7.28	1.22	0.66	0.08	2.68	3.89
1891†		0.63	0.25	2.20	0.78	3.10	1.89	6.77	1.03	0.55	0.07	3.08	4.01
1892†		0.61	0.21	2.05	0.75	2.44	1.84	5.44	1.14	0.53	0.05	3.79	4.54
1893†		0.59	0.26	2.05	0.76	2.51	1.66	5.53	1.20	0.53	0.07	3.70	3.94
1894†		0.66	0.18	1.97	0.67	2.19	1.58	4.35	0.96	0.49	0.04	1.93	2.77
1895†		0.63	0.22	2.16	0.77	2.28	1.79	5.73	1.04	0.49	0.11	1.25	1.82
*1896†		0.66	0.13	2.00	0.60	2.02	1.75	5.19	1.04	0.46	0.11	0.96	1.47
1897†		0.74	0.22	2.12	0.67	2.02	1.74	4.51	1.03	0.51	0.10	2.10	1.36
1898†		0.73	0.19	1.95	0.67	1.94	1.94	4.27	1.00	0.54	0.09	1.72	1.54
1899†		0.75	0.24	2.05	0.61	2.02	2.00	5.47	0.99	0.47	0.10	1.37	1.54
1900†		0.76	0.17	2.09	0.60	2.11	2.08	5.78	1.15	0.48	0.05	1.59	1.65

* The facts for these years are for 53 instead of 52 weeks; corrections have therefore been made in calculating the rates.

† The rates of mortality for the years subsequent to 1890 refer to the City of Manchester as enlarged by the Act of that year. The rates for 1890 and for previous years are those for the three Unions of Manchester, Chorlton, and Prestwich, which have been taken to approximately represent "Manchester."

TABLE H, 1900.—POPULATION, AREA, DENSITY. TOTAL BIRTHS AND DEATHS,
WITH BIRTH AND DEATH RATES.

[INSTITUTION POPULATIONS, BIRTHS AND DEATHS, DISTRIBUTED.]

STATISTICAL DIVISIONS	Estimated Population	Area in Acres	Persons to an Acre	BIRTHS		DEATHS	
				Total	Rate per 1,000	Total	Rate per 1,000
City of Manchester	542,566	12,910	42	17,564	32·37	12,903	23·78
I. Manchester Township..	136,260	1,646	83	4,611	33·84	4,177	30·65
II. North Manchester	159,709	7,321	22	5,169	32·37	3,005	18·82
III. South Manchester	246,597	3,943	63	7,784	31·57	5,721	23·20
I { Ancoats	45,224	400	113	1,668	36·88	1,320	29·19
{ Central	31,194	748	42	891	28·56	1,019	32·67
{ St. George's.....	59,842	498	120	2,052	34·29	1,838	30·71
II. { Cheetham	37,371	919	41	1,169	31·28	544	14·56
{ Crumpsall	8,512	733	12	206	24·20	125	14·69
{ Blackley	8,908	1,840	5	227	25·48	147	16·50
{ Harpurhey	14,884	193	77	530	35·61	282	18·95
{ Moston	11,239	1,297	9	357	31·76	169	15·04
{ Newton Heath	36,496	1,350	27	1,062	29·10	747	20·47
{ Bradford	23,297	288	81	900	38·63	574	24·64
{ Beswick	11,442	96	119	443	38·72	268	23·42
{ Clayton	7,560	605	13	275	36·38	149	19·71
III. { Ardwick	40,766	509	80	1,466	35·96	971	23·82
{ Openshaw	26,841	581	46	963	35·88	589	21·94
{ West Gorton	27,442	318	86	1,008	36·73	630	22·96
{ Rusholme and Kirk. ...	25,221	1,412	18	648	25·69	346	13·72
{ Chorlton-upon-Medlock	58,476	646	90	1,433	24·51	1,302	22·27
{ Hulme.....	67,851	477	142	2,266	33·40	1,883	27·75

NOTE.—Calculated on the Census of 1891 and 1901.

TABLE J, 1900.

BIRTHS REGISTERED IN THE CITY OF MANCHESTER, IN ITS MAIN DIVISIONS
AND IN DISTRICTS; DISTINGUISHING LEGITIMATE AND ILLEGITIMATE BIRTHS;
ALSO THE PROPORTION OF MORTALITY AMONG INFANTS OF BOTH CLASSES UNDER
ONE YEAR OF AGE.

STATISTICAL DIVISIONS	BIRTHS		Percentage of Illegitimate Births to Total Births	DEATHS UNDER 1 YEAR		PROPORTION OF DEATHS UNDER 1 YEAR PER 1,000 BIRTHS		
	Total	Illegitimate		Total	Of Illegitimate Children	Total	Legitimate	Illegitimate
City of Manchester.....	17,564	664	3·8	3,315	287	189	179	432
I. Manchester Township	4,611	215	4·7	1,036	102	225	212	474
II. North Manchester.....	5,169	131	2·5	826	45	160	155	344
III. South Manchester	7,784	318	4·1	1,453	140	186	176	440
I. { Ancoats	1,668	58	3·5	356	33	213	201	569
{ Central	891	59	6·6	217	25	244	231	424
{ St. George's	2,052	98	4·8	463	44	226	214	449
II. { Cheetham	1,169	23	2·0	133	6	114	111	261
{ Crumpsall	206	4	1·9	31	1	150	149	250
{ Blackley.....	227	7	3·1	38	2	167	164	286
{ Harpurhey.....	530	16	3·0	87	2	164	165	125
{ Moston	357	7	2·0	42	3	118	111	429
{ Newton Heath	1,062	28	2·6	177	12	167	160	429
{ Bradford	900	29	3·2	188	12	209	202	414
{ Beswick	443	9	2·0	80	4	181	175	444
{ Clayton	275	8	2·9	50	3	182	176	375
III. { Ardwick	1,466	50	3·4	273	19	186	179	380
{ Openshaw	963	27	2·8	183	13	190	182	481
{ Gorton (West)	1,008	27	2·7	193	22	191	174	815
{ Rusholme and Kirk.	648	19	2·9	82	8	127	118	421
{ Chorlton-on-Medlock	1,433	97	6·8	272	40	190	174	412
{ Hulme	2,266	98	4·3	450	38	199	190	388

TABLE K, 1900.

INFANTILE MORTALITY IN THE CITY, AND ITS THREE MAIN
DIVISIONS.

DEATH-RATES UNDER ONE YEAR PER 1,000 BIRTHS.

CAUSES OF DEATH	City of Manchester	Manchester Township	North Manchester	South Manchester
All Causes	188·74	224·68	159·80	186·66
Measles	3·42	2·17	3·10	4·37
Whooping Cough	9·22	11·71	9·09	7·84
Other Com: Infectious Diseases†	0·63	0·22	0·77	0·77
Diarrhoeal Diseases	35·64	47·50	24·38	36·10
Tubercular Diseases‡	8·43	7·81	6·19	10·28
Convulsions	8·77	11·49	6·00	8·99
Other Nervous Diseases§	3·59	4·55	3·48	3·08
Lung Diseases	35·01	41·42	35·21	31·09
Wasting Diseases ||.....	51·47	60·29	46·43	49·59
Suffocation	0·23	0·43	...	0·26
Found dead in bed	5·75	8·89	3·48	5·40

† These are Smallpox, Scarlatina, Diphtheria, Membranous Croup, and various forms of "Fever," including the chief forms of Typhus and Typhoid.

‡ These are Phthisis, Tubercular Meningitis (Hydrocephalus), Tabes Mesenterica, and General Tuberculosis (Scrofula).

§ These are Meningitis, and other diseases of the Brain and Spinal Cord.

|| These are Premature Birth, and such ill-defined causes as Atrophy, Marasmus, Debility, Inanition, &c.

TABLE L, 1900.—CITY OF MANCHESTER. ANNUAL RATES OF MORTALITY PER 1,000 PERSONS LIVING AT ALL AGES, IN THE CITY OF MANCHESTER AND IN ITS STATISTICAL DIVISIONS, FROM CERTAIN DISEASES AND GROUPS OF DISEASES.

CAUSES OF DEATH	City of Manchester	Manchester Township	North Manchester	South Manchester	City of Manchester Average of 9 years 1891-99
All Causes	23·78	30·65	18·82	23·20	23·02
Smallpox .....	...	...	...	...	0·01
Measles	0·47	0·37	0·53	0·48	0·79
Scarlet Fever	0·19	0·16	0·24	0·18	0·23
Typhus Fever .....	...	...	...	...	...
Whooping Cough	0·68	0·79	0·66	0·64	0·57
Diphtheria, Membranous Croup	0·19	0·18	0·23	0·16	0·20
Ill-defined Fever.....	0·01	0·01	0·01	0·01	0·01
Enteric Fever	0·14	0·14	0·14	0·14	0·22
Influenza	0·44	0·49	0·39	0·45	0·29
Diarrhoeal Diseases	1·52	2·12	1·10	1·45	1·41
Erysipelas	0·05	0·07	0·05	0·04	0·05
Pyæmia	0·02	...	0·03	0·02	0·02
Puerperal Fever	0·05	0·08	0·04	0·04	0·07
Rheumatic Fever	0·05	0·07	0·06	0·04	0·08
Rickets	0·11	0·12	0·06	0·13	0·07
Cancer	0·76	0·87	0·61	0·80	0·67
Tabes Mesenterica.....	0·17	0·18	0·14	0·18	0·21
Hydrocephalus	0·22	0·19	0·16	0·29	0·32
Phthisis	2·09	3·52	1·32	1·80	2·06
Scrofula, Tuberculosis	0·38	0·57	0·26	0·36	0·38
Premature Birth	0·63	0·73	0·50	0·66	0·61
Old Age	0·41	0·38	0·28	0·52	0·47
Brain and Nervous Diseases ...	2·11	2·66	1·68	2·08	2·28
Heart Diseases	2·08	2·44	1·54	2·23	1·80
Bronchitis	2·50	3·38	2·01	2·32	2·43
Pneumonia	2·99	4·12	2·27	2·84	2·44
Respiratory Diseases (other) ...	0·29	0·32	0·22	0·32	0·38
Digestive Organs (Diseases of)	1·15	1·23	0·91	1·27	1·05
Urinary Organs (Diseases of)	0·48	0·68	0·33	0·47	0·51

TABLE M, 1900.—CITY OF MANCHESTER.—ANNUAL RATES OF MORTALITY AT SIX GROUPS OF AGES, * PER 1,000 LIVING AT THOSE AGE GROUPS, FROM CERTAIN PREVALENT DISEASES, AND GROUPS OF DISEASES.

CAUSES OF DEATH	Under 5 Years	5 to 15 Years	15 to 25 Years	25 to 45 Years	45 to 65 Years	Over 65 Years
All Causes	72.74	3.83	4.63	12.83	40.76	130.28
Smallpox .....	...	...	...	...	...	...
Measles	3.40	0.15	...	...	...	...
Scarlatina	1.06	0.21	0.04	0.01	...	...
Diphtheria, Memb. Croup.....	1.04	0.22	...	0.01	...	...
Whooping Cough	5.16	0.11	...	...	...	...
<div> <div> <div>Typhus</div> <div>Fever</div> </div> <div> <div>Enteric</div> <div>Continued .....</div> </div> </div>	...	...	...	...	...	0.07
Diarrhoeal Diseases.....	0.01	0.12	0.17	0.18	0.14	...
Tubercular Diseases	0.01	0.02	0.01	...	...	...
<div> <div>Diarrhoeal Diseases.....</div> <div>Tubercular Diseases</div> </div>	11.07	0.06	0.04	0.04	0.31	1.13
Brain	4.60	0.80	1.58	3.79	4.41	2.48
Heart	4.59	0.28	0.20	0.93	5.09	17.38
Lungs	0.33	0.26	0.48	1.44	6.69	21.21
Digestive System	16.26	0.71	0.82	2.63	10.75	44.18
Urinary System	3.93	0.18	0.22	0.56	2.29	3.40
Other Diseases	0.13	0.06	0.10	0.50	1.38	3.62
	21.15	0.64	0.98	2.73	9.69	36.81

* For death-rates at all ages, see Table L.

TABLE N, 1900.

MANCHESTER.—CERTIFICATION OF THE CAUSES OF DEATH IN THE MAIN
DIVISIONS AND IN DISTRICTS.

STATISTICAL DIVISIONS.	Total Deaths	Certified by		Not Certified	Proportion per cent. of Deaths		
		Registered Medical Practitioners	Coroner		Certified by		Not Certified
					Regist'd Medical Prac- titioners	Coroner	
City of Manchester	12,903	11,810	958	135	91·5	7·4	1·1
I. Manchester Township ...	4,177	3,719	386	72	89·1	9·2	1·7
II. North Manchester	3,005	2,792	188	25	92·9	6·3	0·8
III. South Manchester	5,721	5,299	384	38	92·6	6·7	0·7
I. { Ancoats	1,320	1,178	120	22	89·2	9·1	1·7
{ Central	1,019	878	116	25	86·1	11·4	2·5
{ St. George's	1,838	1,663	150	25	90·5	8·2	1·3
II. { Cheetham	544	506	30	8	93·0	5·5	1·5
{ Crumpsall ..	125	113	11	1	90·4	8·8	0·8
{ Blackley	147	136	11	...	92·5	7·5	...
{ Harpurhey	282	260	18	4	92·2	6·4	1·4
{ Moston	169	160	9	...	94·7	5·3	...
{ Newton Heath	747	701	41	5	93·8	5·5	0·7
{ Bradford	574	531	41	2	92·6	7·1	0·3
{ Beswick	268	249	16	3	92·9	6·0	1·1
{ Clayton	149	136	11	2	91·3	7·4	1·3
III. { Ardwick	971	903	60	8	93·0	6·2	0·8
{ Openshaw	589	555	31	3	94·2	5·3	0·5
{ Gorton (West)	630	574	51	5	91·1	8·1	0·8
{ Rusholme and Kirk. ...	346	318	24	4	91·9	6·9	1·2
{ Chorlton-upon-Medlock	1,302	1,201	93	8	92·2	7·1	0·7
{ Hulme	1,883	1,748	125	10	92·9	6·6	0·5

TABLE O, 1900.—PARTICULARS AS TO MANCHESTER PATIENTS UNDER TREATMENT IN THE SEVERAL FEVER HOSPITALS DURING THE YEAR ; ALSO OF PATIENTS FROM OUTSIDE DISTRICTS SENT TO MONSALL AND CLAYTON DURING THE SAME PERIOD.

DISEASE	HOSPITAL	In Hospital commence- ment of year	Admitted	Discharged	Died	Remaining in Hospital close of year
SMALLPOX	Clayton Hospital .....	...	3	3	...	...
	Total .....	...	3	3	...	...
SCARLET FEVER ...	Monsall	343	2,022	1,873	89	403
	Other Hospitals.....	...	...	...	...	...
	Total	343	2,022	1,873	89	403
DIPHTHERIA	Monsall	18	180	154	34	10
	Other Hospitals .....	...	1	...	1	...
	Total	18	181	154	35	10
ENTERIC FEVER...	Monsall	30	217	194	26	27
	Other Hospitals	3	17	13	6	1
	Total	33	234	207	32	28
TYPHUS FEVER ...	Monsall .....	...	4	3	...	1
	Other Hospitals .....	...	...	...	...	...
	Total .....	...	4	3	...	1
OTHER ACUTE DISEASES	Monsall	15	199	169	15	30
	Other Hospitals .....	...	...	...	...	...
	Total	15	199	169	15	30
ALL DISEASES.....		409	2,643	2,409	171	472

PATIENTS SENT TO MONSALL, FROM DISTRICTS OUTSIDE THE CITY, DURING THE YEAR 1900.

DISEASE	Withing- ton	Moss Side	Sale	Swinton Schools	Royal Infirmary	Cheadle Convalles- cent Home	Pendlebury Hospital	Chorlton Union Workhouse	Other Districts
Smallpox .....	...	...	...	...	...	...	...	...	...
Scarlatina	113	56	24	54	...	1	9	1	...
Diphtheria	4	2	4	1	1	...	...	...	1
Enteric Fever	2	4	3	...	...	...	...	...	...
Other Diseases.....	1	2	2	...	2	1	...	...	2

Total, 290.

TABLE P, 1900.—WORK OF SANITARY DEPARTMENT FOR THE YEAR.

TOWNSHIPS																			
	Ancoats	Central	St. George's	Cheetham	Crumpsall	Blackley	Harpurhey	Moston	Newton	Bradford	Beswick	Clayton	Ardwick	Openshaw	Gorton (West)	Rusholme and Kirkmanshulme	Chorlton-upon-Medlock	Hulme	TOTAL
Complaints to Sanitary Superintendent	1,515	1,295	1,155	1,248	47	58	108	466	959	1,008	467	3	241	835	334	97	803	1,362	12,001
Dwelling-houses	4,979	5,770	5,347	5,241	1,934	543	1,044	771	4,382	1,708	895	1,480	2,664	2,778	2,395	1,233	4,041	8,733	55,938
Newly-infected Dwelling-houses	242	165	271	210	69	39	151	70	264	151	118	43	238	182	180	153	214	357	3,117
Cellars	25	4	2	...	...	...	...	...	1	...	...	...	...	...	...	4	27	96	159
Schools	11	...	16	8	45	7	6	5	49	3	2	2	6	5	4	28	13	7	217
Factories and Workshops	88	492	47	12	20	4	6	...	45	10	6	...	12	17	2	20	41	11	833
Lodging-houses	185	403	689	199	...	2	1	8	12	29	21	2	26	9	7	9	94	265	1,961
Offensive Trades	172	25	52	63	19	1	1	2	43	15	29	2	136	15	15	11	19	151	771
Dairies and Milkshops	92	68	61	242	73	33	32	55	73	26	28	166	103	55	43	110	190	363	1,813
Bakehouses	209	597	155	339	7	27	65	15	100	99	63	13	196	231	301	158	642	494	3,711
Canal Boats	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2,032
Slaughter-houses	3	...	...	...	...	3	...	...	9	...	...	...	...	...	12	6	...	...	33
Tips for Refuse	1	...	6	1	26	3	...	31	40	...	...	...	...	95	...	...	...	...	216
Miscellaneous Inspections	2,539	1,249	1,163	1,085	661	133	257	558	1,727	1,105	545	578	524	1,056	283	368	1,158	1,360	16,349
Factories and Workshops by Shop Hours, &c., Inspectors	1,019	5,512	1,046	1,837	7	28	69	19	136	104	53	14	553	295	417	332	1,625	1,379	14,545
Shops by Shop Hours, &c., Inspectors	219	838	271	353	3	32	132	1	78	70	67	...	221	220	186	245	412	635	3,973
Infected Rooms Fumigated	776	6	302	386	148	70	186	146	826	401	377	77	521	94	16	913	86	248	5,579
Infected Dwellings Re-inspected	821	392	817	508	401	100	365	225	717	414	257	287	412	326	479	439	523	640	8,123
Drains Tested by Water	466	657	345	174	109	23	87	49	609	108	53	7	94	231	96	251	253	175	3,787
Smoke { Observations made	99	206	61	102	49	19	16	15	151	41	10	36	23	54	29	28	79	67	1,085
Abatement { Proceedings before Magistrates	29	48	10	13	15	8	...	7	21	7	1	8	3	7	7	3	20	8	215
Food and { Samples Collected for Analysis	215	130	138	63	3	5	24	36	111	74	49	21	161	80	114	61	167	194	*1,730
teration { Proceedings before Magistrates	9	23	15	2	...	...	...	...	...	...	...	4	4	11	1	...	11	8	88
Ashpits reported to Cleansing Department for emptying	23	53	17	30	1,000	122	73	364	249	159	10	405	4	139	666	259	193	7	3,773
Receptacles reported to Cleansing Department for emptying	190	213	256	1,382	15	3	47	...	67	16	35	4	52	23	44	22	147	115	2,631
Notices issued for Abatement of Nuisances	1,164	1,341	1,357	1,384	206	192	330	186	774	343	148	163	500	563	506	529	1,026	1,693	12,405
Letters written for Abatement of Nuisances	153	87	120	182	40	8	8	4	40	13	9	11	7	38	38	10	88	158	1,014
Reports made to Medical Officer of Health	3,038	2,773	2,204	1,742	517	340	614	438	2,428	2,129	954	600	2,382	2,784	1,920	1,333	2,629	4,584	33,409
Legal proceedings taken	38	19	46	12	3	2	1	...	5	1	1	...	...	3	7	1	18	24	181
Total Nuisances abated	1,499	775	1,324	1,411	188	160	384	150	616	441	195	134	371	564	352	698	1,264	1,604	12,130
Number of Cottages under Five Rooms	7,435	4,964	9,037	729	522	923	688	367	4,409	2,621	1,285	402	4,552	3,510	3,221	826	3,805	8,167	57,463

* 84 Samples from Outside City.

INDEX.

	PAGE		PAGE
Admissions to hospitals	221	Death-rates.....	I, 8, 215
Age effect of, on death rate..	9	,, at different ages	11
Antitoxic serum treatment	180	,, corrected and recorded	
Area of City and districts in acres ...	215	for 33 towns	2
Arsenical poisoning	156	,, in England and Wales..	4
		,, gains and losses	8
Bacteriological examination	50, 73, 109	,, effect of age on... ..	9
Bakehouses	158, 159	,, at various age-groups in	
Births	I, 215	1900 compared with	
,, Illegitimate	11, 216	Manchester 1891-1899	
Birth-rates.....	I, 3, 212-213, 215	and England and	
,, in England and Wales ...	4	Wales 1881-1890.....	10
Blood serum test in enteric fever ...	73	,, influence of sex on.....	11
Breast-fed children	105	,, recorded and corrected	
British and Irish products, exports of	4	in groups of civil	
Butchers' meat, prices of	6	parishes	12
		,, in the homes of the	
Census figures.. ..	I, 3	people, in work-	
Certification of cause of death	220	houses, and in hos-	
Childhood, deaths at	211	pitals	13-14
Childhood mortality	11	,, in districts	215
Cleansing Department, work of	198, 199	,, specified causes	219
Closets, condition of	34-36, 84-85	Delépine, Prof., investigations by, 50, 73, 109	
,, number of	198	Density of population	215
Coal, prices of	6	Diarrhoea	102-107
Compulsory notification	17	,, tables regarding	102-104
Condition of closets.....	34-36, 84-85	,, effect of season.....	104
Consumption	107-134	,, and breast-fed children....	105
Coroner's inquests.....	220	,, chart	107
Corrected and recorded death-rates		Diphtheria and Membranous Croup. 47-68	
in Manchester compared with 33		,, tables regarding	47-49
towns	2	,, and incidence on City ...	50
,, in groups of civil parishes.	12	,, and distribution	50
		,, and bacteriological exam-	
Danger of plague	87-94	ination	50-58
Deaths.....	I, 215	,, and direct infection	58
,, in public institutions.....	7	,, and return cases	59
,, from infectious diseases for		,, and influence of schools...	59
10 years.....	17	,, and overlooked cases....	59
,, in age-groups	204-207	,, and paralytic compli-	
,, males	209	cations	62-66
,, females	210	,, fouling of the ground and	
,, in infancy	211	closets	66
,, in childhood	211	,, insanitary conditions asso-	
		ciated with	67
		,, and outbreak in hospital.	173

INDEX—*continued.*

	PAGE		PAGE
Deaths and tracheotomy.....	182	Infectious diseases.....	17-18
District mortality ...	13, 215	Infective power of dust	128-134
Dust, infective power of.....	128-134	Influence of sex on death-rate	11
Effluvium nuisances	162-165	Inquests, Coroner's	220
Effect of age on death-rate	9	Insanitary dwellings	159-162
Enteric fever	68-85	Institution death-rates	13-14
,, tables regarding	68-71	Irish and British products, exports of	4
,, seasonal wave.....	72	Isolation hospitals	221
,, and water pollution ...	73	Isolation (special) and treatment of	
,, and ice cream	73	cases of scarlet fever before dis-	
,, and overlooked cases...	73	charge.....	26-32
,, and bacteriological ex-			
amination	73	Jewish Health Visitor — Special	
,, and direct infection.....	74-78	Work	168
,, and milk infection	79-82	Jewish Ladies' Society for Visiting	
,, and shell fish	83-84	the Poor	165-168
,, and condition of the			
closets	84-85	Ladies' Public Health Society	165-168
,, and tepid bath treat-		Manchester Union	6
ment in hospital	175	Markets—seizure of unwholesome	
,, and inoculation with		food	200-202
vaccine	169	Married, persons	1
Estimated population	1, 3, 215	Marriage-rates	1, 3, 5, 212, 213
Excess of births over deaths	1	,, in England and Wales	4
Exports of British and Irish products	4	Measles prevalence	95-101
		,, tables regarding.....	95-96
Fever, scarlet..	21-46	,, and schools	98-101
,, enteric	68-85	Membranous croup—see diphtheria..	47-68
,, typhus	86-87, 177	Milk and tuberculosis.....	135-155
,, isolation of cases	221	Milk supply and scarlet fever.....	46
,, bacteriological work.....	50, 73	Milk infection and enteric fever	79
,, hospital, admissions to.....	221	Monsall Fever Hospital—Report of	
Flour, price of	6	Medical Superintendent	169-182
Food, seizure of unwholesome.....	200-202	Mortality at ages groups.....	219
		,, corrected	2
Gains and losses	8	,, male and female.....	10
Grazing and housing of cows..	137	,, infantile	217
		,, childhood	219
Homes of the people, death-rates in	13-14	,, and illegitimacy	216
Home Infections	32	,, comparison in divisions...	215
Hospitals, fever admissions.....	221	Notification of infectious diseases ...	17-18
Hospitals, death-rate	13-14	Nuisances, effluvium.....	162-165
House Drainage Department	197		
Housing of the working classes ...	159-162	Overlooked cases	59, 73
Housing and grazing of cows.....	137		
		Pail closets.....	34, 66
Ice cream poisoning	155	Pauperism	6
Illegitimacy and mortality	11, 216	Persons to an acre.....	215
Illegitimate births	216	Phthisis.....	107-134
Importation of plague	87-94	Plague.....	87-94
Infantile deaths	217	Poisoning and ice cream	155
Infantile mortality	11, 217	,, arsenical.....	156
		Population, estimates of.....	1, 3, 13, 215
		,, natural increase of	1
		,, density of	215

INDEX—*continued*.

	PAGE		PAGE
Provisions, &c., prices of	6	Tuberculosis and milk	135
Public institutions, deaths in	7	,, and Manchester cow-	
,, ,, mortality	13	sheds.....	136
Recorded and corrected death-rates		,, and Manchester cows...	136
in 33 towns	2	,, and housing and grazing	
,, in groups of civil parishes	12	of cows in Manchester	137
Return cases of scarlet fever	26-32	,, and milk clauses	139
Sanitary Department, work of, 182-197, 222		,, and tuberculous milks	139-141
Sex, influence of, on death-rate	11	,, and disposal of cows hav-	
Scarlet fever	21-46	ing tuberculous udders	141
,, and tables regarding ...	21-24	Typhoid fever—see enteric fever ...	68-85
,, and bacteria in the soil.	26	Typhus fever	86-87, 177
,, return cases of.....	26-32		
,, and home infections ...	32-33	Uncertified deaths	220
,, and connection with de-		Unhealthy dwellings	159-162
fective privies	34-36		
,, and school infection..26, 37-46		Vital statistics	1-16
,, and milk supply	46		
School Board and measles, &c.	98	Wave, seasonal, of infectious disease	18
Sex rates in age groups	10	Whooping cough, prevalence	96-101
Seizure of unwholesome food	200-202	,, tables regarding	96-97
Shell fish and enteric fever	83-84	Work of Sanitary Department..182-197,222	
Smallpox.....	18-20	Workhouse death-rate	13
Summer diarrhœa	102-107	Working classes, housing of	159-162
Treatment and special isolation of		Zymotic diseases	17
cases of scarlet fever before dis-			
charge	26-32		

